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No. 13
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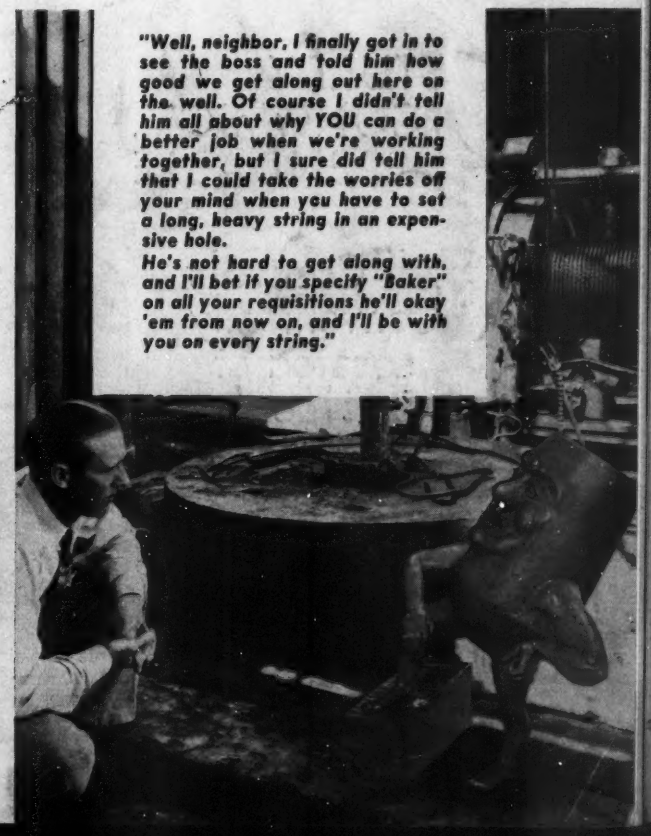

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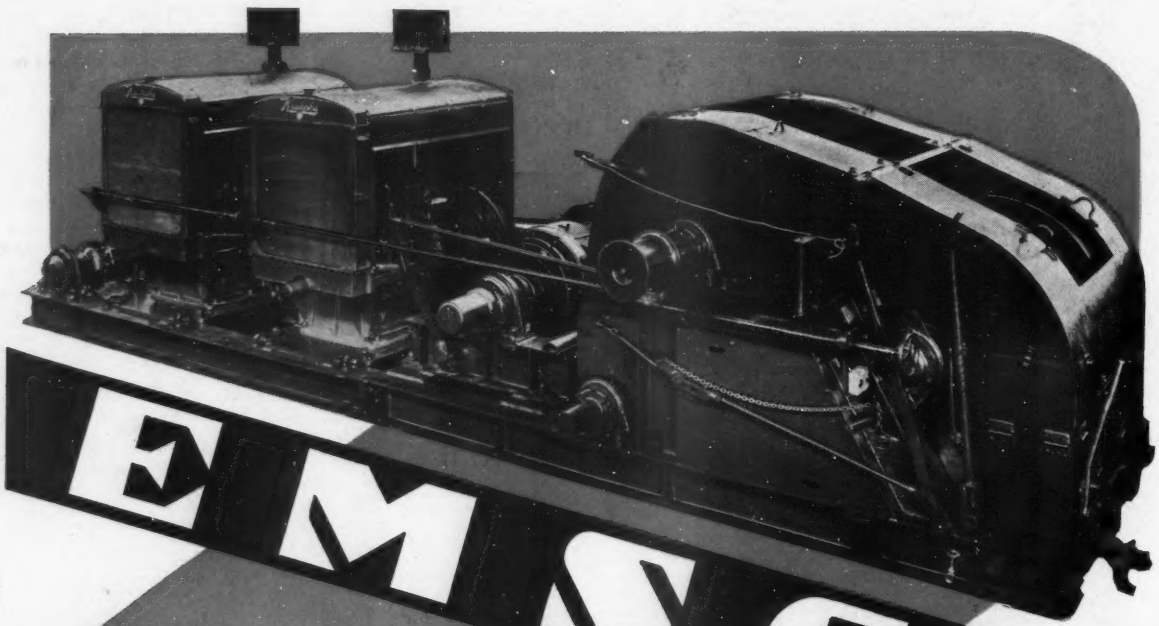

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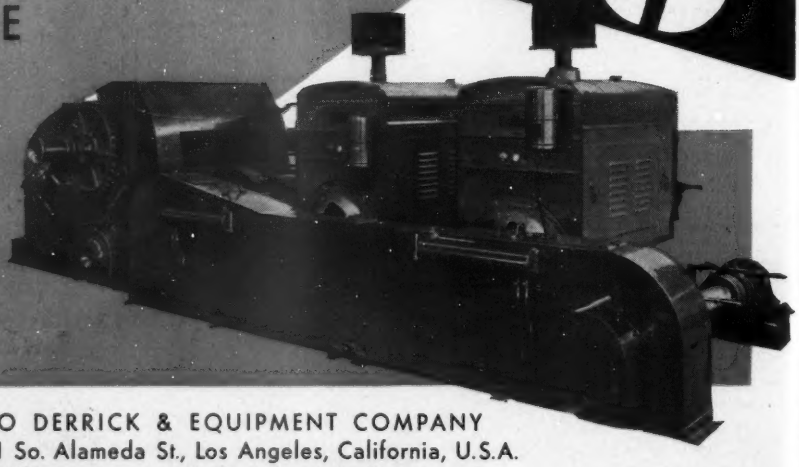

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OCTOBER 15, 1936
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THE WORLD'S FIRST OIL TRADE PUBLICATION

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Coming Events

Oct. 19-23—A.I.M.E. Meeting, Statler Hotel, Cleveland, Ohio.

Oct. 22—I.C.C. hearings re proposed pipeline rate reduction. Examiner Kelly's recommendation of 35% rate reduction for transporting crude oil and reduction of minimum tender requirements to not over 10,000 bbls. disputed by pipeline companies.

Oct. 25-30—Assn. of Gas Appliance & Equipment Mfrs. 1st Annual Convention, Atlantic City.

Nov. 5—C.N.G.A. Regular Fall Meeting, Biltmore Hotel. Big day planned. Better keep this date open.

Nov. 9-12—American Petroleum Institute 17th Annual meeting. Stevens Hotel, Chicago.

Nov. 20—Mid-Continent Oil & Gas Assn. Annual Membership Meeting, Tulsa, Oklahoma.

Nov. 30—Independent Petroleum Association of America, Seventh Annual Meeting, Oklahoma Biltmore Hotel, Oklahoma City, Okla.

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ARMIES march in Spain; and brother battles brother to the death. Russia, sprawling her vast bulk over half of Asia, eyes the growing triumph of the Rightist forces in the former realm of King Alfonso and rumbles forth her first challenging ultimatum to those nations who might assist in the destruction of the Communistic tide. Thousands of sympathizers for both causes pour through the streets of Paris, destroying property and assaulting those of opposite political belief. In London, a Fascist demonstration is broken up by radical sympathizers who scream for the death of the Fascist leader, a member of the British nobility. Italy mobilizes her people for war, starts training six-year-olds to drill with dummy rifles and march in grim military formation through the streets of ancient Rome, shouting the Fascist war-cry and with their arms upraised in a pledge to the Italian dictator. Germany, surrounded by her enemies, afraid of Russia, afraid of her traditional foe, France, hears the tramping feet of marching men echoing again through the streets of far flung capitols and calls upon her people to sacrifice what little they may have left in order that the army—the military machine—may be strengthened.

A few thousand miles to the west of us lies the Orient, seething, restless, torn by internal dissension and lying practically prostrate at the feet of Japan, whose dream of an Eastern Empire has become an all-consuming desire that bids fair to be realized at last. India revolts, and in the Americas Mexico finds herself struggling against the sudden assaults made upon religious beliefs centuries old.

All of these things may appear remote; of little significance to men whose political problems at home are confined to choosing between two men whose policies differ, as yet, but in minor details when compared to the utterly irreconcilable and bloody disagreements that exist elsewhere in the world. For life, to the average American, while not without grief, is still free from the hatred, the blood lust and the killing that ravage the streets of Europe and Asia. Things are peaceful here, a sense of unshakable security prevails in the United States that is, in itself, the most insidious influence, the Trojan horse within our gates that may well yet destroy us.

For it must be remembered that those unhappy people charging across the shell-pocked streets of old Spain did not, of their own deliberate choosing, decide that they suddenly hated those who disagreed with them, hated and feared them to the extent that they were willing to stain their fingers with the red blood of those whom they had formerly loved. No man would make that choice were it offered him while he was both reasonable and sane. Those people did not leave their homes one morning and suddenly decide to wage bloody war on those neighbors who preferred a somewhat different type of government; they were led into that ghastly charge by thousands of little decisions, none of prime importance, perhaps, but whose collective effect was such that once the ball had started rolling there was no power on earth that could stop it, nothing that could prevent it from gaining in size and momentum until at last it burst into a thousand bloody pieces on the jagged rocks of revolution and civil war.

Today our political horizon is unclouded by the open warfare of the type that exists in Europe. The only clouds darkening our sky are the grim rumors of sanguinary skirmishes between striking workers and citizens in many corners of the nation; that, and the growing importance of the decision to be faced at the coming presidential election. More people every day are coming to the realization that no man, and no nation can ride two horses in two different directions indefinitely; that the time must come, and is fast approaching when one or another of the two lines of travel must be abandoned. The voters of the country must be made to realize that political action is cumulative, that no one measure can be weighed by itself without taking into consideration the effect that measure will have on future legislation. The residual effect of any political act is often of much greater import than the immediate outcome. One step leads to another. The situation created by one measure may often force the adoption of a second and more radical act, even over the protests of the very people who advocated the first. That any man would deliberately set out to bring about the conditions now extant in Europe is unthinkable; but that a man, intent upon correcting only certain flagrant evils wanted by no one, might put in operation forces beyond his control whose ultimate outcome might be the very thing he wanted to avoid, is a very practical possibility.

We have been told it is unwise to start something we can't finish; we may well be cautioned against starting something we might not want to finish. That faults exist in our present political structure goes without saying. That those faults can be corrected within the confines of our own type of home-grown government without the adoption of foreign methods and the importation of foreign ideals is something that we sincerely believe. That any action need be taken which might unleash forces capable of resulting in the kind of armed conflict now existing in Europe, is, in our minds, unnecessary. Our cherished background of free speech, of free choice in the direction of our own lives, and of our right to choose the kind of government we want, will, in our opinion, save us from the flames now devouring Europe. Our people must, and no doubt will, settle their differences with ballot boxes, not with rifles, bayonets and bombs. In a world gone mad, only the retention of our national sanity can save us.

Technician Makes Analysis of Probable Future Demand for California Crude Oil

Local Pacific Coast Demand Will Probably Require Utilization of all California Production Within Next Few Years

By ALLAN H. HAND

WHEN considering the question of future demand for crude petroleum in California, one must first decide whether it is to be approached in the light of the definition of "demand" when used in economics, i.e., "The quantity of any commodity required or sought in the market," or in the light of markets developed to dispose of total supply. Therefore, is the California demand of future years to be predicated on a continuation of supplying markets developed following the surplus production commencing in 1922, or predicated on supplying what would be termed economic markets? If the latter, what are economic markets?

Obviously, the Pacific Coast states and Canada, Alaska, Hawaii and probably the Pacific side of Central and South America, can be considered as normal markets for California petroleum products. While there have been small quantities of gasoline shipped into the Pacific Coast from East Texas, transportation costs, plus import taxes in the case of foreign oil, are a sufficient barrier to justify considering that these markets will be retained.

But how about our participation in Atlantic and Pacific foreign and Intercoastal markets?

Diminished Foreign Markets

During the five years preceding 1931 California shipped substantial quantities of gasoline to the United Kingdom and to France, Germany and Italy. During recent years our business in European markets has been restricted to occasional shipments of gasoline and Kettleman crude. This loss of business is occasioned by the development of production in the Mid-Continent, principally East Texas, and in Iraq, Rumania, Venezuela and other closer producing areas, which makes it impossible at the prevailing crude oil prices for California to be competitive in supplying any substantial portion of these markets. It is therefore apparent that under a stabilized price structure that will return the California producer a reasonable price for his oil, future Atlantic foreign business will be restricted to occasional spot cargo sales.

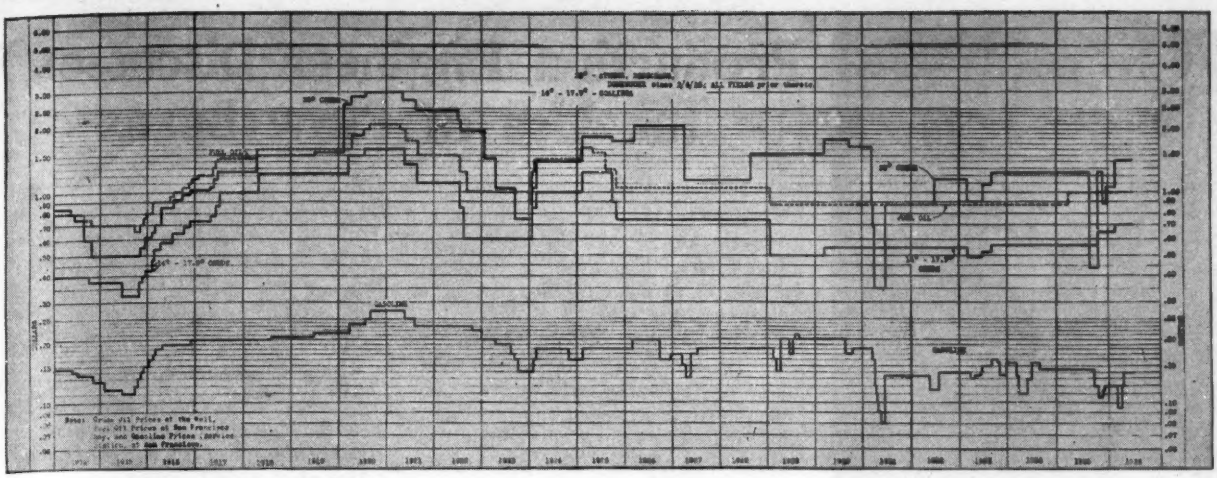
Allan H. Hand
Production Engineer, Union Oil Company

As to Pacific foreign shipments which, in addition to Central and South America, consist principally of shipments to Japan, China, Australia and New Zealand: A considerable portion of the business we had with Australia and New Zealand up until four or five years ago is now being supplied from the East Indies. So far development of production in Russian Sakhalin has had little effect on our business with the Orient. Substantial reserves have been developed in Bahrein Island, and while it is too early to forecast what effect this supply will have on our shipments to Japan, substantial quantities of this crude are now being shipped into that country. Needless to say, if there is a considerable decline in the state's production, resulting in a materially higher price schedule for our crude, there will be a substantial reduction in our Pacific foreign business.

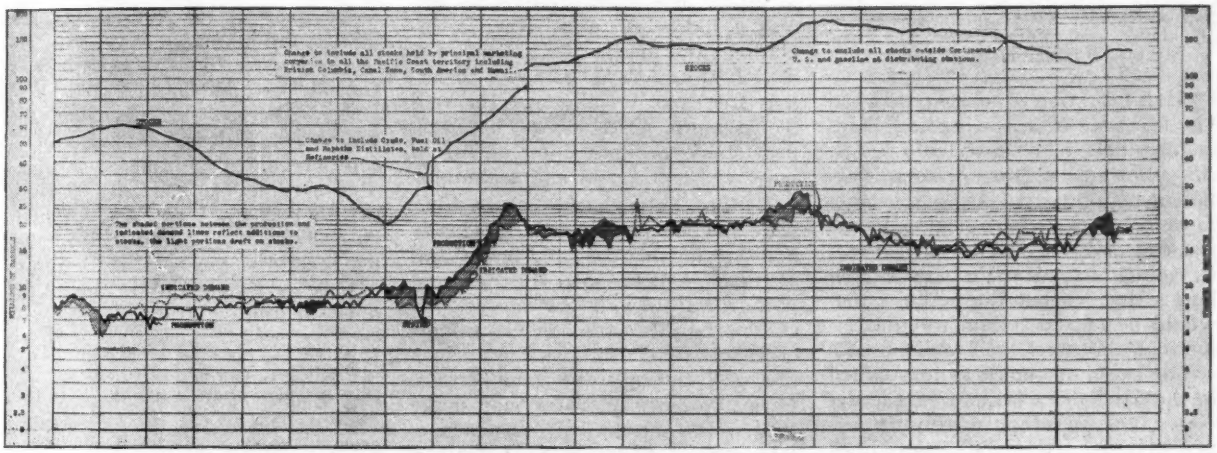
East Coast Shipments

The same situation holds true in the case of our East Coast business. With the exception of shipment of some 15,000,000 barrels of fuel oil during 1933 and 1934, which was in effect a reduction of the excessive stocks existing in California, fuel oil movements to the East Coast have been quite limited, shipments being almost entirely gasoline. If the production in Texas, Oklahoma and Louisiana holds up as it gives promise to and the same relationship is maintained between the price schedules for Mid-Continent crudes, we cannot economically ship to the Atlantic Seaboard. As an illustration, our present posted schedule is based on 27 gravity Signal Hill crude at $1.10 a barrel which by straight run operations will yield around 27% of gasoline, whereas 36 gravity Oklahoma-Kansas crude, which has a straight run gasoline yield of around 36%, is posted at this same price, and 36 gravity crude in West Central Texas, with about the same gasoline content, is posted at only $1.00 a barrel. East Texas crude will yield about 36% gasoline from straight run operations, the present price schedule for which is $1.15 a barrel. California is at a further disadvantage by reason of the difference in transportation costs to the Atlantic Seaboard. Pipe line transportation from Oklahoma to the Gulf is quoted at 32½c and from East Texas to the Gulf at 12½c a barrel while steamer rates are now running about 22c a barrel from the Gulf to the Atlantic Seaboard. This makes a total transportation cost of 54½c per barrel for

A paper entitled "Future Demand for California Petroleum Products," presented at the Petroleum Section meeting of the A.I.M.E. held in Los Angeles October 1-2, 1936.



SHOWING VARIATION IN PRICES OF CRUDE OIL AND PRODUCTS SINCE 1914



SHOWING VARIATION IN PRODUCTION AND DEMAND SINCE 1914.

Oklahoma gasoline and 34½c a barrel for East Texas gasoline moved to the East Coast by water. As opposed to this, prevailing steamship rates alone from California to the Atlantic Seaboard are about 60c a barrel and not long ago ran as high as 84c. Obviously, unless some adjustment is made of the disparity in the posted crude prices, any present or continuing surplus gasoline in California shipped to the Atlantic Seaboard will have to be sold at a price that will not, after taking into consideration the realization from the other products, return the posted price for crude.

With the foregoing in mind, the question then arises why during the last five years or so, has California been continuing such large shipments out of the Pacific Coast territory? Recalling the efforts put forth and the sacrifices made to reduce the production of crude oil to profitable market demands, it would be well to consider what disposition has been made of the production during that period.

Pacific Coast Demand

Before doing so, it is interesting to consider the increase in our Pacific Coast demand during the past fifteen years and the growth of our offshore business following the development of the Los Angeles Basin fields. Also, the effect on our Atlantic foreign and Intercoastal shipmets of the flush production from the East Texas field starting in 1931.

Taking only the last five and one-half years, our crude oil consumption as compared with the quantity produced has been:

	Crude Oil—Barrels Daily	
	Consumption	Production
1931	520,000	516,000
1932	494,000	487,000
1933	484,000	474,000
1934	476,000	481,000
1935	566,000	569,000
First half 1936	600,000	594,000

Our gasoline consumption and shipments during the fifteen and one-half years starting with January 1, 1921 have been as set forth in the tabulation shown as Table I.

It will therefore be seen that our consumption followed the same trend as the production. In other words, primarily as a result of the curtailment efforts in 1932, the production averaged 29,000 barrels a day less than the year previous and the consumption declined 26,000 barrels a day. Likewise, the tremendous increase in production following the collapse of curtailment in the summer of last year resulted in the production for 1935 averaging 88,000 barrels a day more than it did in 1934 and the consumption increased 90,000 barrels a day, although in this case, because of the impossibility of immediately developing markets to dispose of the surplus, it was reflected in additions to

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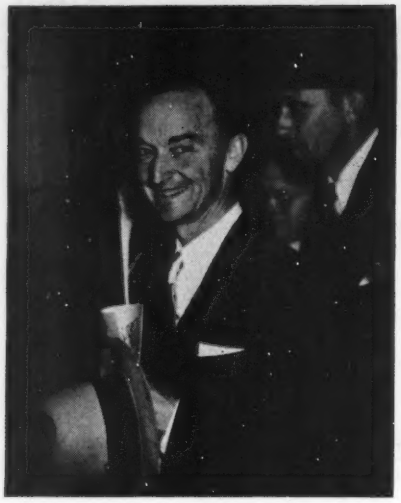

E. L. DAVIS

Staff photographer catches informal picture of Mr. Davis and Mr. Wilhelm at recent A.I.M.E. meeting.

Production Engineer Discusses the Use of Flow Beans

By E. L. DAVIS

THE Question of whether to open the bean of a flowing well wider, or pinch it in, has been a favorite subject of argument of production men for years. He who wants more oil now, is for opening it up; the conservative insists on beaning it, feeling that ultimate benefits will be greater. What the actual effect would be or the reason for that effect is usually not well understood.

The bean, or choke, as it is called in the Midcontinent, is a simple device. It is, in effect, merely an orifice placed in the production lines from the well for the purpose of applying a back pressure on a flowing well or to limit its rate of flow.

It exerts a resistance proportional to the square of the rate of flow of the oil-gas mixture that the well produces. Increasing the back pressure or resistance a flowing well must overcome to produce oil, reduces the flow of oil and gas, and thereby, of course, decreases the current profit of the operator.

Reasons For Use

Then why should the operator resort to beaning? He may base it upon previous experience, or merely upon superstition. He may have a good reason. Some of these reasons are as follows:

1.—To prevent sanding up of the well. Too great a rate of inflow of oil and gas to the well bore from the formation may entrain loose sand and bring it into the well, filling the hole and necessitating cleaning out. Also, too great a reduction of pressure in the well compared to that existing in the formation near the well may in extreme cases (Torrance-Redondo) cause a block of formation to shift toward the hole, collapsing the pipe.

2. To prevent cutting out of fittings at the well head due to sand blasting by sand carried in the production stream. Sand cuts due to high velocity. Beaning reduces the velocity of the fluid in the tubing by compression until it is past the essential controlling fittings at the well. This cutting out used to be a rather common occurrence and was a source of great expense, including the danger of losing the well if the control fittings (Christmas tree) cut out allowing the well to blow wild. This danger has been practically eliminated by means of improved equipment and technique.

3. To hold back encroaching edge or bottom waters. In many fields water fills the sand below and at the edge of the oil. During rapid withdrawal of oil, the more open and permeable sands give up their oil first. Water follows the oil into the well through the same strata. Large volumes of water may make the well impractical to produce. Beaning is desirable to permit a more uniform withdrawal of oil from the sands and a uniform encroachment of edge waters through all the oil bearing sands. This beaning needs to be done early, before water encroachment has gone too far. It is of little benefit after water reaches the well.

4. Beaning is used to prevent what is called "heading" in a well. Heading consists of the well flowing strongly for short periods, followed by periods of no flow (see illustration). During the flow period most of the oil and gas may be blown out of the well, which then requires a fill-up period until sufficient pressure accumulates to start flow again. This rapid alternating of periods of high and low pressure is a severe strain on the oil well casing and formation. Beaning reduces the rate of flow of the heads and tends to spread out the flowing period to cover the time when the well would otherwise be dead. Thus it holds a relatively uniform pressure against the oil sand.

5. In line with the preventing of heading, beaning may be used to prolong the flowing life of a well that would otherwise need to be pumped.

Normal Flowing Conditions

Normal flowing conditions and a heading sequence are shown in the illustration. Figure 1 shows normal flowing conditions. The space between tubing and casing is filled only with gas down to the base of the tubing. The oil and gas mixture as it rises in the tubing becomes lighter and increases in velocity, but is a relatively constant mixture. Assuming so-called "unit" ratio of oil and gas, or 1000 c.f. per barrel, this mixture varies from about 80 per cent of gas by volume at the base of the tubing to perhaps 95 to 98 per cent at the lead lines. A minimum velocity of about 9 linear feet per second at the base of the tubing is necessary to maintain the uniformity of this mixture and prevent settling out of the oil.

Figure 2 shows a slug of oil containing less than normal gas entering the base of the tubing. The increased weight of the flow column demands an increased casing pressure to balance it; hence both oil and gas rise in the annular space. This space continues to take most of the gas produced until it is full of gas. The heavy slug of fluid is then blown from the tubing followed by the excess gas that had accummulated in the annular space (Figure 3). As this gas pressure blows down without carrying fluid, the back pressure on the well is quickly reduced and the well responds with a surge (Figure 4). The fluid rising in the annular space forces a repetition of the heading cycle to No. 2. If the required maximum pressure is greater than the well is capable of building up, it will remain dead.

If the bean is now made small enough, its resistance builds up so high when the heavy flow of oil and gas hit, that the oil flow is spread out and the stored up gas pressure is prevented from exhausting itself. Then the rising surge of oil is picked up by the remaining gas and carried

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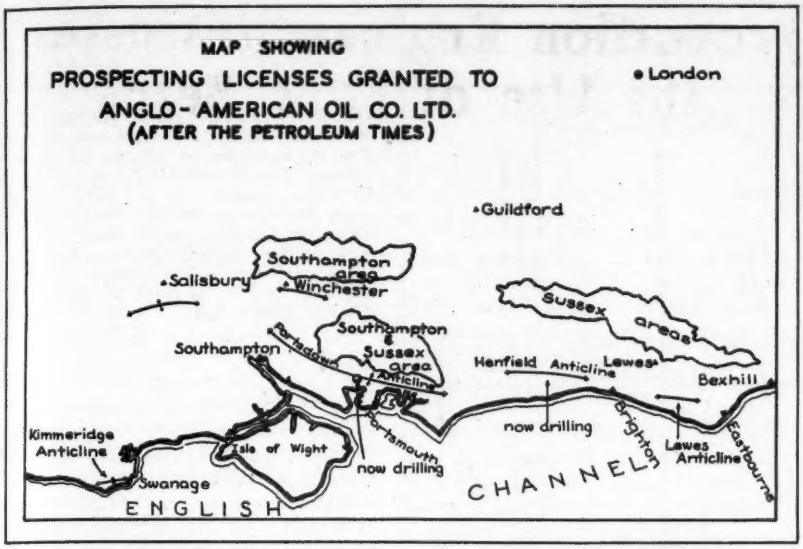

Possibility of Oil Production in Europe Believed to be Good

EUROPE will likely become a much larger producer of oil in the near future. England will probably produce oil commercially from the area where test wells are now being drilled. Germany is drilling constantly and carrying on geological and geophysical exploration and within five years will be able to produce 25% of the national daily demand, or 100,000 bbls., against the 7000 now being taken from the existing wells.

Such are the conclusions reached by Dana Hogan, California independent operator, who has just returned from a visit of several months in Europe, during which he visited the various fields and prospects in these countries.

Mr. Hogan has long been a student of European oil geology. He has visited England and Germany before, collected geological maps and data of every kind, noted the limited amount of drilling, and the shallow depths reached until quite recent years. Convinced of the great possibilities lying in England and Germany Mr. Hogan three years ago sought a concession to drill on the Isle of Wight on the southern coast of England, as shown on the accompanying map. He failed in his application and the territory he sought went to the Anglo-Iranian Oil Co. (formerly the Anglo-Persian), owned in part by the British government. However, he obtained a German concession which he disposed of during his last trip to a large operating company.

British Seeks Naval Fuel

Great Britain stands in vital need of supplies of crude oil from wells in the home islands, from which may be produced fuel and lubricants for the Navy, motor gasoline for the motorized land forces, and aviation fuel for the air forces. The need for these supplies is pressing and is the force motivating the enactment without opposition from any source of the law to regulate and encourage prospecting for and development of home supplies, now limited to small quantities extracted from Scotch shales.

Before the advent of oil as marine fuel Great Britain had a naval advantage over the world in the great English coal mines, which produce the finest solid steaming fuel in the world. But some years before the World War far-seeing Admiral Sir John Fisher began the study of the advantages of oil afloat. He found them so great as to render negligible any advantages derived from British coal supplies at home. He converted the Admiralty and the nation of his views. The World War vindicated him as to the superiority of the liquid fuel and proved that a coal-burning navy is worthless in warfare today.

Oil Won War for Allies

Oil fuel won the war for the allies at sea, its lack was a fatal handicap to the German battle fleet. At the same time the war brought out clearly British weakness in the lack of oil supplies at home. All oil had to be brought overseas by tankers several thousand miles from the United States, Latin America, or Persia. The submarines sought them eagerly as victims and every oil carrier sunk by the U-boats was considered a battle won. The undersea campaign might easily have proved fatal had the war continued indefinitely.

When the Kaiser proclaimed the intention to "Starve England in 90 days," it is safe to say he was thinking of the naval hunger for fuel oil. In the end the cutting off of the German oil supplies from Roumania, leaving the submarines unable to operate for lack of fuel, was probably a much greater factor in ending the war than has been generally recognized.

Since the War's end the British Admiralty has bent every effort to safeguard the nation against another such peril by shipping huge war supplies to the home isles from abroad and storing it, although recognizing, no doubt, the danger always inherent in reliance upon such stocks for a prolonged war—the possibility of the destruction or exhaustion of the imported supplies and the impossibility of replenishing them during hostilities, a condition quite likely to spell national disaster.

Apparently, it took the British authorities a long time to be convinced that there was any substantial hope of finding oil at home, although Mr. Hogan declares that there are abundant indications of formations quite capable of being productive. This discouraging attitude has apparently been removed by prolonged geological studies, now reinforced by geophysical explorations.

Systematic Development

Once convinced of the home possibilities for oil the British have gone in for systematic development by huge aggregations of capital exclusively under national control. No haphazard individual work appears to be contemplated. Under the law no royalties will be paid to the government, only taxes; to the landowners no royalties will be payable, only compensation for the use of the surface and for any actual damage to surface properties. Regulations

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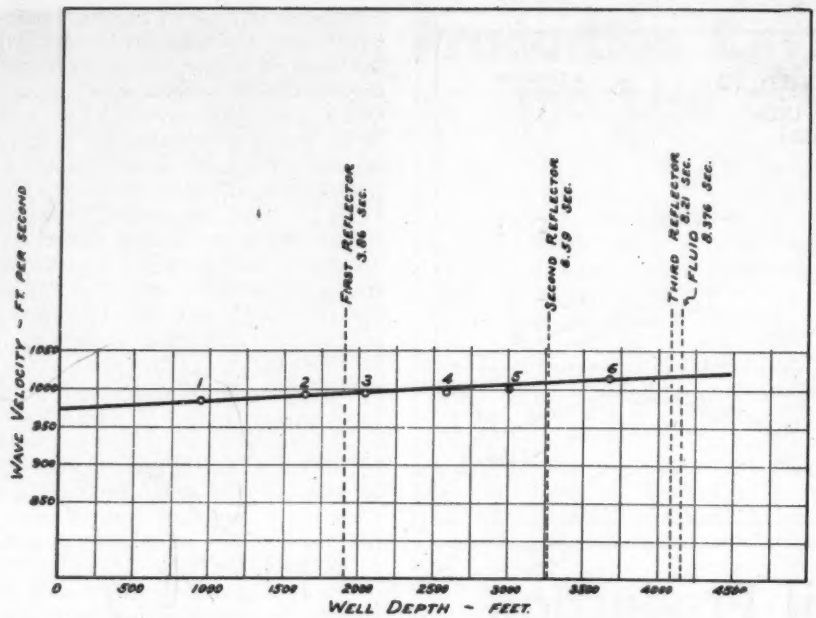


Figure 2.

Quanity of gas 6,000 cu. ft. per day. Gravity of gas 1.21. Point No. 1—mean velocity—Top to first reflector. Point No. 2—mean velocity—Top to second reflector. Point No. 3—mean velocity—Top to third reflector. Point No. 4—mean velocity—First reflector to second reflector. Point 5—mean velocity—First reflector to third reflector. Point No. 6—mean velocity—Second reflector to third reflector. Velocity increases 1.1 per cent per 1000 ft. of well depth.

The Depthograph, a New Instrument for the Production Engineer

By C. P. WALKER

DETERMINING the distance to remote objects by observing the time required for sound to traverse the intervening space is an old practice. Attempts have been made to use this method for determining the fluid level in oil wells but as far as the writer is aware it was not found to be practicable. This is for the reason that vibrations in gas in the audible frequency range do not travel as well and as far as low frequency pressure waves which are capable of transmitting a greater amount of energy than can be transmitted by audible waves. Wood in his book "Sound" states that in a given medium the range of sound transmission will vary inversely as the square of the frequency. The fact that the sound from a whistle having a low tone has a much lower attenuation rate than that from a high pitch whistle is well known. Also the pressure waves caused by cannon fire often rattles windows at points so distant that no sound is heard from the cannon.

In 1932 Mr. P. E. Lehr and Mr. H. T. Wyatt, of the Shell Oil Company, experimented with the principle of the concussion, or pressure wave echo method of determining fluid levels in oil wells. They released compressed gas into the top of the casing thereby creating a pressure wave which traveled down the well and back again. Their experiments proved conclusively that, with the proper apparatus for recording the echoes and determining the velocities at which the waves travel, the method could be used successfully for determining fluid levels in oil wells.

Wells are often equipped with from one to three tubing catchers and these together with the top of the liner are frequently above the fluid. Each of these obstructions reflects a part of the pressure wave. In such wells there may be, therefore, as many as five pressure wave reflections. Thus it is obvious that in order to identify the various reflections and to determine therefrom the fluid level in a well it is necessary to obtain a graphic record of these reflections.

Development of Instrument

In 1935 the writer began the development of suitable instruments and apparatus for making use of the pressure wave method of determining fluid levels in oil wells on a commercial basis.

For the preliminary studies an electric oscillograph was used with a microphone for receiving the wave reflections. Commercial microphones proved to be entirely unsuited to the needs as the frequency of the pressure wave was on the order of about three cycles per second. These microphones were too sensitive to the audible and other high frequency sounds and not sufficiently sensitive to the low frequency pressure wave. Consequently the high frequency, or audible sounds, produced by sucker rods and by the hiss of gas through valves and leaks obscured the wave reflections from the fluid level and other obstructions whose depth were to be determined.

As there was not available a microphone with sufficiently low frequency response to receive these wave reflections and the time available in which to develop one was insufficient it was decided to build a mechanical receiver. The receiver consists of a diaphragm one side of which is exposed to the well casing space through a two inch tube.

The space behind the diaphragm is also connected into the casing for the purpose of equalizing the casing static pressure on both sides of the diaphragm. The present design of the Depthograph is capable of operation with casing pressures up to 500 pounds per square inch.

The diaphragm actuates a small mirror. A light beam directed against the mirror is reflected into an optical system where its movement is simplified and a part of it is directed onto a ground glass for observation and another part of it is projected onto a strip of moving sensitized paper and photographed.

The sensitized paper is usually run at the rate of about 2" per second making a record chart 20" long for a well where the fluid is 5000 ft.

A paper entitled "The Depthograph" presented at the Petroleum Section meeting of the A. I. M. E. on October 1-2, 1936, Los Angeles, California.

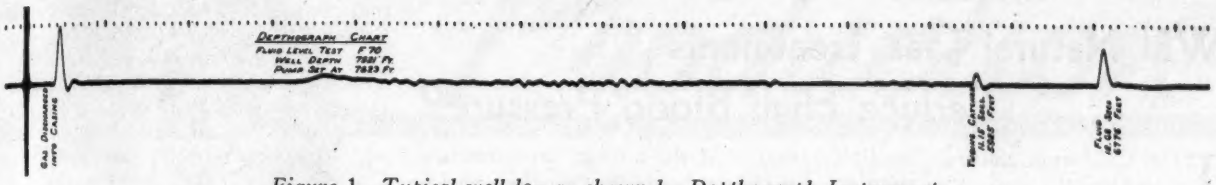


Figure 1—Typical well log as shown by Depthograph Instrument.

from the top. Each inch on the chart represents approximately 250 ft. of depth in the well. This large scale chart makes it easy to read off the depth accurately. The chart speed may be varied from one inch to five inches per second at will.

A tuning fork controlled synchronous motor driven timer puts a series of time marks along one edge of the record chart. There is a mark on the chart for every 0.1 second. At the end of every second the time mark is about twice as large as the intervening 0.1 second marks. This makes it possible to quickly determine the time intervals to the various echoes.

Service Truck

The body of the truck for transporting the instruments and equipment is made light tight and is equipped with facilities for developing and fixing the record charts. In about eight minutes after completing a fluid level test the chart can be developed and made ready for inspection.

At the moment of releasing the compressed gas into the casing to produce the pressure wave the recording apparatus is connected to the casing through a small needle valve. This is for the purpose of obtaining a record of the start of the pressure wave from the top of the well. A moment after the gas is released into the casing the main valve connecting the instrument diaphragm chamber to the casing is opened. This makes the instrument sensitive for receiving the reflected pressure waves.

The velocity at which the pressure wave travels in the well is the same as the velocity at which sound waves would travel. This velocity varies from about 850 to over 1400 feet per second in the various wells and depends upon the composition of gas contained in the well.

Many wells have a tubing catcher above the fluid level and the distance down to it is usually known. Catchers reflect a part of the wave and are easily located on the Depthograph charts. This provides an easy means of accurately determining the wave velocity in the well

Where there is not an obstruction such as a catcher at a known location or a liner top in the well to reflect back a wave it is necessary to determine the velocity at which the pressure wave travels in the well under test in order to determine the fluid level. As it has been found to be impossible to calculate this velocity from the physical properties of a sample of the well gas secured at the surface, a search of considerable literature on the subject was made in an effort to find a suitable method of measuring it, but no accurate method suitable for field use could be found. It was then decided that velocity measuring apparatus should be developed making use of a low frequency wave.

The apparatus designed and built for these velocity measurements consists of a tube about 2" in diameter and 12 ft. long, through which gas from the well under test flows, a device for creating and maintaining a pressure wave oscillation in the tube and an instrument for detecting the existance of perfect resonance in the tube.

Creation of Waves

If ones hand is clapped over the end of a tube which is closed at the opposite end and the tube is not too short the wave thus created can be felt as it oscillates from one end to the other of the tube. The first idea

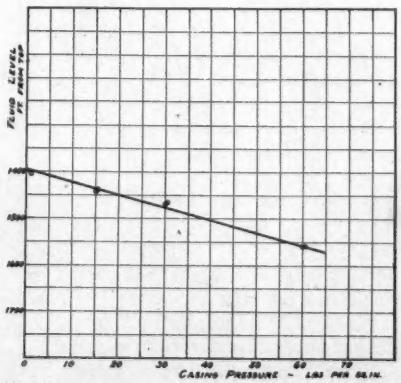


Fig. 3—

Fluid level receded 1 ft. for each 0.375 pound per sq. inch pressure increment at the fluid surface indicating dense fluid.

considered was to photograph such an oscillating wave, which would rapidly decay in the tube, and from the photograph determine the frequency of oscillations. From this known frequency and the known length of the tube the rate of wave travel in the tube could be determined. This method was considered too long and tedious and not sufficiently accurate, so it was decided to maintain the oscillations in the tube either electrically or mechanically and obtain a longer photographic record of the oscillations in the tube, thus making the process more accurate. The next step along this line of reasoning was to maintain the oscillations at the rate at which they would naturally oscillate without outside interference, that is, produce resonance in the tube by electrical or mechanical means and provide a means of determining the rate of application of the impulses which maintained the resonance. This requirement was not difficult to meet and in the present form of the instrument the impulses are applied to the tube pneumatically by means of a valve driven by an adjustable speed motor. A revolution recorder attached to the motor shaft provides the means of determining the frequency of oscillations in the tube.

Air is used as the basis for all gas velocity measurements. The frequency at which resonance occurs with gas in the tube is compared directly with the resonant frequency with air in the tube. Knowing the velocity at which the pressure wave will travel in air the velocity in the tube with gas flowing through it is directly proportional to the resonant frequency. For example, if the resonant frequency with gas in the tube is 10% higher than it is with air in it the velocity of the wave in the gas is 10% faster than it is in air.

To indicate the condition of perfect resonance in the tube one end of it is attached to the same diaphragm operated mirror system which is used for indicating and photographing the pressure wave

(*Turn to Page* 24)

Will Natural Gas Treatments Reduce High Blood Pressure?

THE California Natural Gasoline Association held its regular monthly meeting in the Town & Gown Hall, on the U.S.C. campus, last Thursday evening. The two speakers on the evening program were Prof. David R. Drury, Professor of Physiology, University of Southern California, and Dave Horrell, Assistant Football Coach of U.C.L.A.

Professor Drury has for some considerable time been making various technical experiments to determine the effect that the breathing of natural gas has upon the human system, particularly if natural gas is a toxic poison. Through a rather tedious series of explanations he told of his first experiments upon rats, then monkeys, and later upon humans; he told of the extreme scientific care taken in making these experiments; of the array of instruments used, including everything from pressure gauges to pitot tubes; of the mental and physical reactions of both man and beast, even to the sex life of the animal, and summed up his entire work with the conclusion that the breathing of natural gas, other than causing suffocation in cases of excess, produces no toxic poison effect to the system.

Among some of the effects that were noticed by Prof. Drury in his experiments were: (1) White rats, who are normally quite fussy in their breeding habits, carried on their natural habits while living in an atmosphere having a natural gas content of twenty-five per cent, and that these same rats lived comfortably in an atmosphere of eighty per cent natural gas and twenty per cent oxygen. (2) Monkeys that were subjected to the experiments became tamer than usual after being in an atmosphere saturated with natural gas. Otherwise they remained monkeys, and showed no effects of their new atmosphere. (3) A detailed study of the human being living in an atmosphere laden with natural gas showed only one effect, that could be noticed, and that was the reduction of the blood pressure. In Professor Drury's experiments, four human beings, and judging from the lantern slides shown Professor Drury was one of them, lived for several days in an atmosphere having a high natural gas content. These human beings were carefully measured and calibrated before and after the experiment, and careful tests conducted during the experiment. The only effect that could be noticed, which affected all four subjects, was the reduction of the blood pressure of the individuals. Maybe a future treatment for patients suffering from high blood pressure will be an hour a day in a natural gas laden room. It was interesting to note that in spite of all the careful experiments conducted, Professor Drury neglected to have a fractional analysis made of the gas used, and was unaware if the gas contained the usual odor indicator used by the gas company.

Many of the audience could have told Professor Drury of breathing natural gas in large and small quantities over various periods of time, particularly those pioneers who worked in the old compression and refrigeration gasoline plants, where the Baker Cooler rooms had to be steamed out frequently and repairing of equipment undertaken in a gas laden atmosphere. Outside of a natural gas jag, which they frequently got on such occasions, there appeared to be no serious effects.

Dave Horrell was a bit doubtful about coming to the meeting after he heard that it was to be held on the U.S.C. campus, but the program committee assured him that it would be all right. Horrell gave a very interesting talk on the prospects of the various Coast conference teams in the football games this fall. He thought that U.C.L.A. had a better team than last year, and that the team as a whole would give a good account of itself.

■ ■ ■

On The Side

We missed Tommy Wade (Parkhill-Wade if you don't know) from the meeting. Understand he expects to be in Denver for some considerable time.

■ ■

Bill Robinson just returned from the San Joaquin Valley with a bad cold and a new Studebaker. He would like to keep the Studebaker.

■ ■

Julian Campbell says he is back in the business with a new absorber, not "millions" but "billions" of bubbles.

■ ■

We wonder what that MacFarland (Gilmore)—Taggart story is about —the one that involves missing baggage, Palace Hotel, etc.

■ ■

Jim Reed and "Wat" Watson take their politics seriously, judging from their dinner table conversation. Lang helped out, too.

■ ■

Harold Moulton's bad cold did not keep him from the meeting, anyway.

■ ■

Did you notice that look of extreme complacency on Ernie Adams' face while he was listening to the natural gas-monkey paper?

■ ■

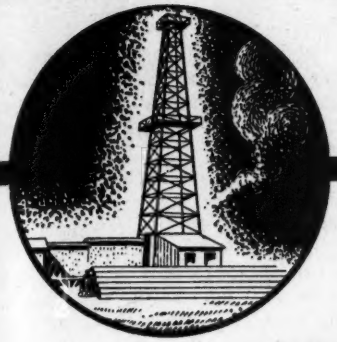
We thought Tom Taggart was Irish, but apparently the close proximity of Ireland and Scotland is responsible for Tom's complaint to Dave Horrell about the price of ducats.

■ ■

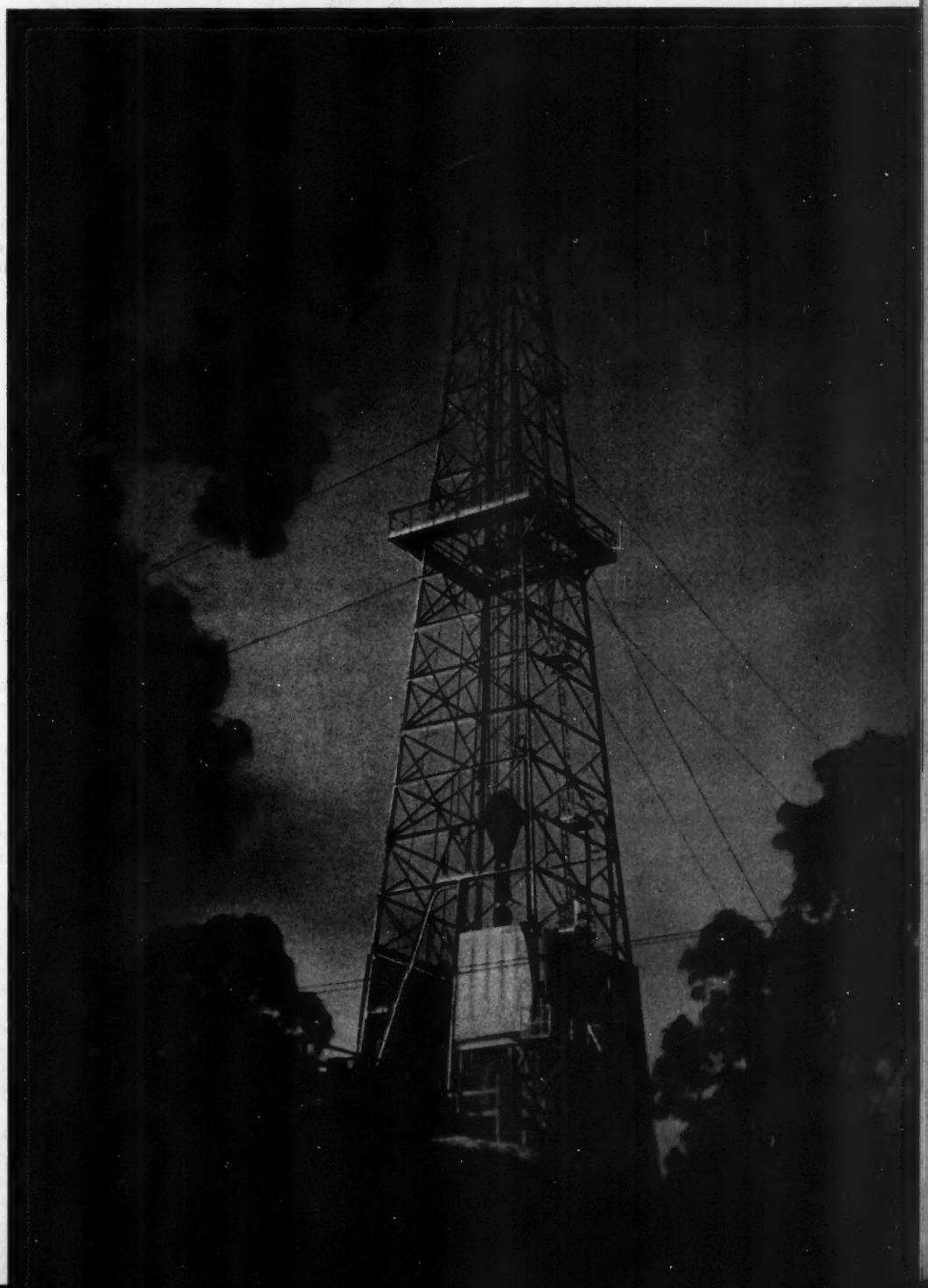
The movies were very silent.

Coyote Land Leased

Oil Conservation, Ltd., has leased 11 acres at East Coyote near the Abrams, DeAugustine & Daily well. The lease is a part of the acreage held by Armstrong, Babcock & Rowan. J. Warren Miller of the Oil Well Core Drilling Co. is active in Oil Conservation. Wm. Crittenden is president, W. W. Webb vice-president and Chas. Stone superintendent.



Production



Photographed for California Oil World by Herbert Lyman Emerson

State Decision That Wilmington New Field Prohibits Townlot Drilling In Area

WILMINGTON has been designated by the State Division of Oil & Gas as a separate field on a distinct structure and in no way connected with the Torrance structure. The only exceptions to this rule are the old Ranger well, Sunset's Lupie lease, formerly held by Pacific Investment Co. (Chas. Baer), and possibly a small undrilled area in that immediate vicinity.

As designated by the State, the eastern boundary of the Torrance field, which will be the western line of the new Wilmington field, lies in sec. 31, 6, 7, 8, 19, and 30, twp. 4-14. Everything east of this line is considered as being in the new Wilmington field. This designation takes in the Sovereign, the Harbor Drilling Co. the Bankline, the General Petroleum and any other wells that may be started in their neighborhood.

Wilmington's north boundary, as designated by the State, runs through the center of secs. 20, 21, 22, and 23, twp. 4-13; the east line through the center of secs. 23, 26 and 35, twp. 4-13, while the south line is somewhere near the ocean or somewhere out under the sea.

Lot Owners May Not Drill

Under this ruling Wilmington may not be drilled on the townlot basis. Every one desirous of drilling must obtain a community lease not less than one acre in area, and, as the clumsily drafted law stands, a lot owner who may be so unfortunate as not to get into a community lease must stand by and see his oil drained and appropriated by neighbors. Quite likely some lawyers think this section would be declared unconstitutional if tested judicially, as probably it will be, but if experience with the law's delay and technicalities teaches anything, the hope for real relief through the courts is none too bright.

Anticipating the state's anti-townlot ruling, the Bankline blocked out a large number of community leases before starting to drill and its example has been followed by others coming in since. The General Petroleum's property is all acreage leased from big corporations. Its Terminal No. 1 well is now below 7000 ft. and still drilling for a deeper sand.

Bad as is the state law from the viewpoint of the lot-owner, the City of Los Angeles is making matters worse. An ordinance has been passed under which it is necessary not only to assemble a full one-acre community lease in order to drill but the entire acre must be on one side of the street. Two or three permits have already been refused where an acre has been included within the lease because some of the lots were on opposite sides of a street. Under this ordinance, should a block contain one more than an acre and a drilling company refuse to take in more than exactly one acre, the owner of the extra lot could not lease to the company operating just across the street. On the other hand, a block containing less than an acre could not be drilled at all since the difference could not be made up by leasing in an immediately adjoining block.

On its face, the city ordinance appears to be in direct conflict with the state law which does not consider an intervening highway as breaking the continuity of a lease. However, here again, unless the City Council may be persuaded to be reasonable and adopt an amendment, appeal will be necessary to determine the validity of the ordinance.

As published recently in these columns, an effort will be made to get the legislature, when it meets next January, to modify the law so as to force community leaseholders to take in any detached parcels of land which otherwise could be drained without permitting the owners to protect them.

■ ■ ■

McAdams Sunshine Acres Well Not Promising

VANDA Petroleum Corp. (Ed McAdams) may abandon its 7958-ft. well in Sunshine Acres, east of Santa Fe Springs, without making a production test. A test of the formation was far from encouraging and the company may decide not to spend the money required for further work.

The present well was started from the surface location of the old Rohde-McAdams well which was a producer until put out of business by an earthquake. The present well has been surveyed and found to be straight but no one knows where the older well was bottomed. The nearest actual production is about half a mile west, but all of this comes from the Meyer sand which is quite shallow and could have no relation to the deep production the old Rohde-McAdams well obtained.

Quite possible explanation of what has been developed by the present well is offered by the following theory which some field men hold. Deep sands, the Upper and Lower Clark and the Connell, underlie the old field, and at the time the old well was producing there were other deep wells within three quarter miles producing from one or the other of these sands. During the intervening years, however, these deep wells have found their production falling away and have been abandoned. It may have been that the Rohde-McAdams well drifting somewhere to the west found a then productive stringer of one of these deep sands. At the present time it is considered doubtful if any of them would be productive at any point near Sunshine Acres.

If the Vanda well is abandoned without commercial results, it would apparently definitely establish Sunshine Acres as non-productive. Other wells drilled about the same time as the Rohde-McAdams failed to get production. Test of the Meyer sand at that time found it barren. The only well that produced recently from the Meyer within less than half a mile of Sunshine Acres was one drilled by L. E. Bishop and taken over by John P. Flaming, an oil worker, who lived on the ground and pumped about 100 bbls. for several years. When the yield fell off he redrilled but was never able to restore production.

Incidentally, these late developments establish clearly the fact that a number of wells located east of the present McAdams well just before 1929, and never drilled, could not possibly have succeeded, and the depression therefore saved money for any who might otherwise have invested in them.

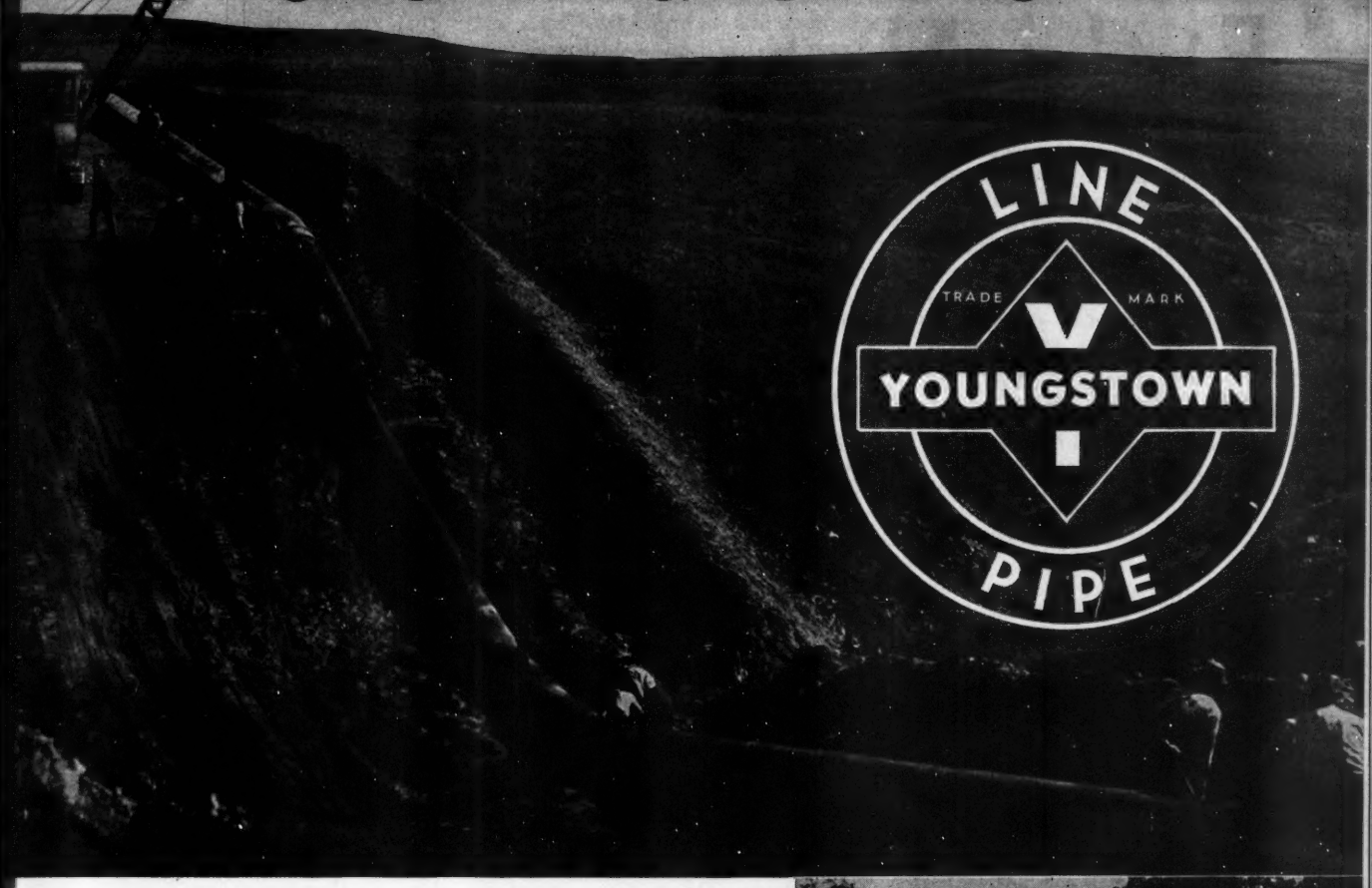
■ ■ ■

Al Hawks: "Why do you have so many dates with that girl?"

Young man: "Because I want to."

Al, suspiciously: "Want to what?"

YOUNGSTOWN



THE ARTERIES OF THE OIL INDUSTRY MUST BE DEPENDABLE . . . . . .

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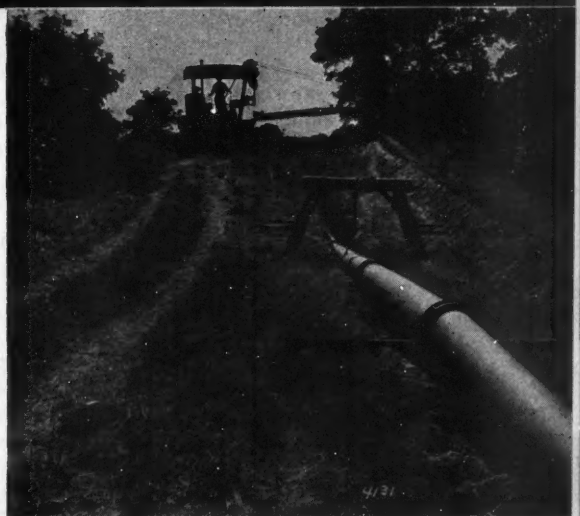


Field Notes

TWO more huge areas are to be prospected by the core drill in the immediate future. If the data are found satisfactory, the leases and the information will be handed over to operators who want them to develop them on terms satisfactory to the Hall-Baker Co., which is doing the work after acquiring leases which run to several tens of thousands of acres.

Hall-Baker Co., which recently completed a similar prospecting campaign on part of the Tejon ranch, now being drilled by Reserve Oil & Gas Co., has already drilled one core-hole and is starting a second in the first of the new areas where it plans to do as it did on the Tejon. The work on the other area will begin later.

First comes the territory from Poso Creek north to and a little beyond the Tulare County line. In this district many successful wells have been drilled, but there remain quite extensive tracts not yet tested, and others where wells have been drilled only to get little oil or none despite plenty of evidence that oil ought to be close around and probably in commercial quantities. The territory is crossed by a number of faults and the core drill is expected to uncover a mass of valuable information concerning their exact location, width, length and trend, and to where the best traps lie.

The first core hole has been drilled on sec. 27, 25-27, to the southeast of Delano on the Quinn ranch, the second is being started on sec. 20, 25-27. On the sw¼ sec. 20, several years ago C. C. M. O. drilled to 3900 ft., scored a failure and then tried elsewhere in this same area with like results. The failures were charged each time in popular oil theory to having located "on the wrong side of the fault." Other failures suggest that it is yet undiscovered which is the right and which is the wrong side in several cases. On the sw¼ sec. 23 to the east, Helen Petroleum (Max McVey), went to 2300 and obtained nothing, but the depth may not have been sufficient to be conclusive. C. C. M. O. drilled another failure, depth unavailable, on the se¼ sec. 23. On sec. 28, immediately to the south, the Hodgeman well, one of the first drilled in this region, went to 1592, and on sec. 33 E. C. Johnson drilled, also without success.

Further southeast in twp. 26-28 lies the Dominion producing area brought in by Bruce Frame. All around the edges of this small pool failures have been drilled. In township 27-28 is located the Mt. Poso field.

It is Hall-Baker's intention to test the Delano-Jasmine area first, then to move gradually south. The southern limit of their holdings is the Poso Creek road. The core holes will be generally between 2000 and 2500 ft. deep. Quickly and inexpensively drilled, the core holes, the analysis of the cores. Schlumberger tests and the use of the geoanalyzer will give a complete picture of the subsurface, enabling the geologist to see what is unfindable by surface studies, to note more accurately the trend of faults, the dip and overturns of formations. The work may show the reason for some of the failures of wells apparently well located.

The survey will take in the Famosa, Lerdo, and McVan areas, as well as the districts previously named.

In Monterey County

From Paso Robles to King City, a distance of about 50 miles through the Salinas Valley, along both sides of the Southern Pacific and of the State Highway, Hall-Baker have leased nearly everything open to lease, and will start shortly on a core drilling campaign extending the entire distance.

About 80% of this vast area lies in Monterey County and the rest in northern San Luis Obispo. For more than 30 years drilling has been carried on at points extending all the way from Paso Robles to King City, and north to Greenfield, and extending east to and over the San Benito County line. Some 33 years ago Standard Oil drilled a series of wells in Peachtree Valley, east of King City, all were dry. However, they were cable-drilled and at a time before the many modern methods of testing the formations and detecting the presence of oil were known. Since then General Petroleum, Associated, Shell, Union, the Doheny interests and a number of lesser companies have punched the ground around King City, San Lucas, Bradley, San Miguel and the intervening country, all without result other than such costly acquired geological data thus uncovered.

Notwithstanding all this drilling, accompanied by vast geological studies, geophysical tests throughout the last eight years, and the extension of millions of dollars, not a barrel of oil has yet been commercially produced in Monterey County. It has been sometimes called "California's graveyard of hopes." Nevertheless there are abundant signs of oil possibilities,—anticlines plainly visible to the geologist at the surface, outcrops, seepages, and the wells drilled have disclosed the presence of formations often oil-bearing in California, as well as sands carrying non-commercial quantities of oil. In fact, Monterey County appears to contain everything to make several good oil fields with the exception of commercial oil, but the last is still lacking so far as the drill has yet found.

A series of core holes placed to explore a vast area may lead to highly important discoveries as to formations and enable future drilling to be located more scientifically.

Lake to Drill

F. W. Lake, former drilling superintendent of Union, is now in charge of field operations of the Mountain Petroleum Co. His first job is to drill four wells in sec. 21, 29-27 at Fruitvale. Mountain No. 1 is now rigging.

Pomoc in Oil Sand

Pomoc Oil Co. reports encountering 127 feet of saturated oil formation in its Pomoc-Perris No. 8 in sec. 15, 32-33, Midway Sunset, Kern County. Three sands were penetrated below 2400 to bottom 2870 ft. Pomoc plans to drill 27 wells on its 140 acres which adjoin Interstate Oil Co.'s production, according to W. F. Leonard, superintendent.

Dumas Starts New Well

Dumas-Lewis Oil Co. has started erecting derrick for its No. 3, offsetting the Walken's flowing wells, and Shell's No. 1 at Redondo. This is the third of the 16 wells to be drilled by Dumas-Lewis on this lease. From now on drilling operations will be continuous, according to Vern Dumas, president.

■ ■ ■

Campbell Oil Co., Wm. Campbell of Long Beach, president, expects to start building the derrick for a well on sec. 6, 28-29, Round Mt., offsetting Golden Bear, Petroleum Securities and C. C. M. O.

■ ■ ■

American Exploration Co. (William Taylor, president) is preparing its well in the Premier area, Kern County. Italo Petroleum is preparing a new well nearby.

Oil Possibilities in Europe Look Bright

(*Continued from Page 7*)

will require all possible precautions against damage, enforce the removal of derricks as soon as possible when drilling has been completed, and the scientific plugging of all abandoned wells.

Oil Prospects on South Coast

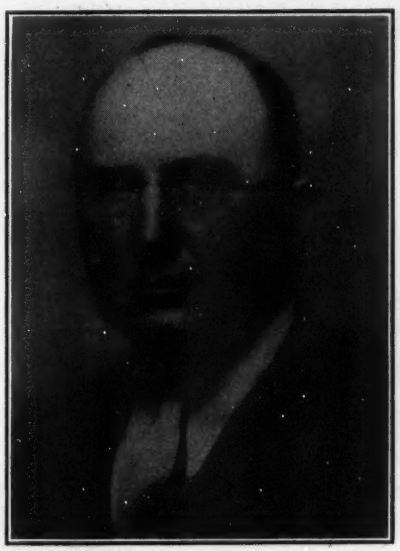
On the south coast within 100 miles of London two wells are being drilled, both by the Anglo-Iranian Oil Co. One located about 45 miles northwest of Brighton, a famous seaside resort, was down about 2900 ft. a few weeks ago; the other located just back of Portsmouth, the leading British naval port, and near Southampton, was close to 4000 at the same time. There is a clearly defined anticline at each of these places. The cores, Mr. Hogan says, are quite interesting and promise surprises for the great majority of the people, professional and non-professional, informed and uninformed, who have always thought there is practically no chance for commercial oil in England. The company is prepared to go down indefinitely to make a complete test.

Study of the geology of this region, says Mr. Hogan, establishes the fact that there exist all conditions favorable for oil. There is found sedimentary rocks, Tertiary, Cretaceous, Carboniferous, Jurassic, Devonian, Salurian, and others may be found below. Finally, there is an outcrop of oil sand at Purbeck west of the Isle of Wight, which was seen by Mr. Hogan three years ago and led him to apply for part of the concession which the Anglo-Iranian has acquired.

The well at Portsmouth has been found to be stratigraphically lower than the Brighton well. Both are considered sufficiently encouraging to continue drilling. Anglo-Iranian is prepared to continue to indefinite depths for a complete test. It may be noted that recently Sir John Cadman of Anglo-Iranian made a statement in which, while discouraging any idea that a huge field was likely to be found, admitted that there was ground for hoping that commercial results might be obtained.

Anglo-American Steps In

Anglo-American Oil Co., British subsidiary of Standard of New Jersey, has just acquired five concessions covering a total of 478 square miles lying immediately to the north of the Anglo-Iranian wells and principal holdings. The accompanying map shows the Anglo-Iranian concessions and the surrounding territory, all of which last is held by Anglo-Iranian. Under the terms of the concessions Anglo-American has three years in which to drill. It is already prospecting the territory geologically and geophysically before deciding upon any locations. However, the Petroleum Times,



DANA HOGAN

London, Aug. 8, expresses the opinion that wells will be started within six months.

Anglo-Iranian's concessions in these areas number 39 and they surround the Anglo-American on practically all sides. They cover large parts of Sussex, Hampshire and Dorset. Additional to these concessions in the south Anglo-Iranian has other huge concessions over a large prospective area on the northeast coast to the west, north and south of Hull, a leading seaport. The prospective area spreads over a large part of Lincoln and the East Riding.

Several million acres are included within these concessions. With the exception of the two wells mentioned above, there has been no drilling whatever in any part of these concessions.

During the World War a test well was drilled in the north of England, more than 200 miles from the area now under consideration, and resulted in the discovery of some 35 to 40 bbls. per day in Carboniferous formation. There appear to be no plans for further work here at present.

Germany Wants Oil

At present Germany produces about 7000 bbls. per day. Prospecting is active and becoming more so. Military, as well as commercial considerations are pushing the work. The best field is around Hanover. Standard of New Jersey, Socony-Vacuum, and Shell have all acquired concessions in northwestern Germany. Socony-Vacuum recently bought the concessions of the North European Oil Co. covering more than 1,000,000 acres. Besides these operations, Socony-Vacuum has a subsidiary drilling a deep test in the south in the area of Munich, Bavaria.

Germany's oil has all been developed since the World War. The trivial production existing before that time was all in Alsace-Lorraine, now under French rule.

Just as with Great Britain, war experience is the cause of Germany's intensive search for oil, which to date has attained a success far in excess of the British efforts. In addition to the fatal handicap imposed upon the British battleships and cruisers by their dependence upon coal and the breakdown of the submarine campaign when Roumanian oil supplies failed, the German field armies were handicapped by their dependence upon steam railroad transportation because of the lack of fuel needed to maintain a huge motorized land transport.

Scarcely was peace established than the Germans began an intensive search for oil through the national territory. While scientific study has been applied to the problem of extracting oil and gasoline from coal and shale, and to the use of substitutes for motor fuel, the drilling of wells has steadily moved forward. Under the Hitler regime the campaign is being pushed as one of the most important parts of the movement to make Germany self-sustaining and independent of other countries for all supplies.

Austria Has Natural Gas Field

In Austria natural gas has been found in the vicinity of Vienna and is being developed. It is being used locally and may become a source of industrial expansion in the near future.

Manufactured under
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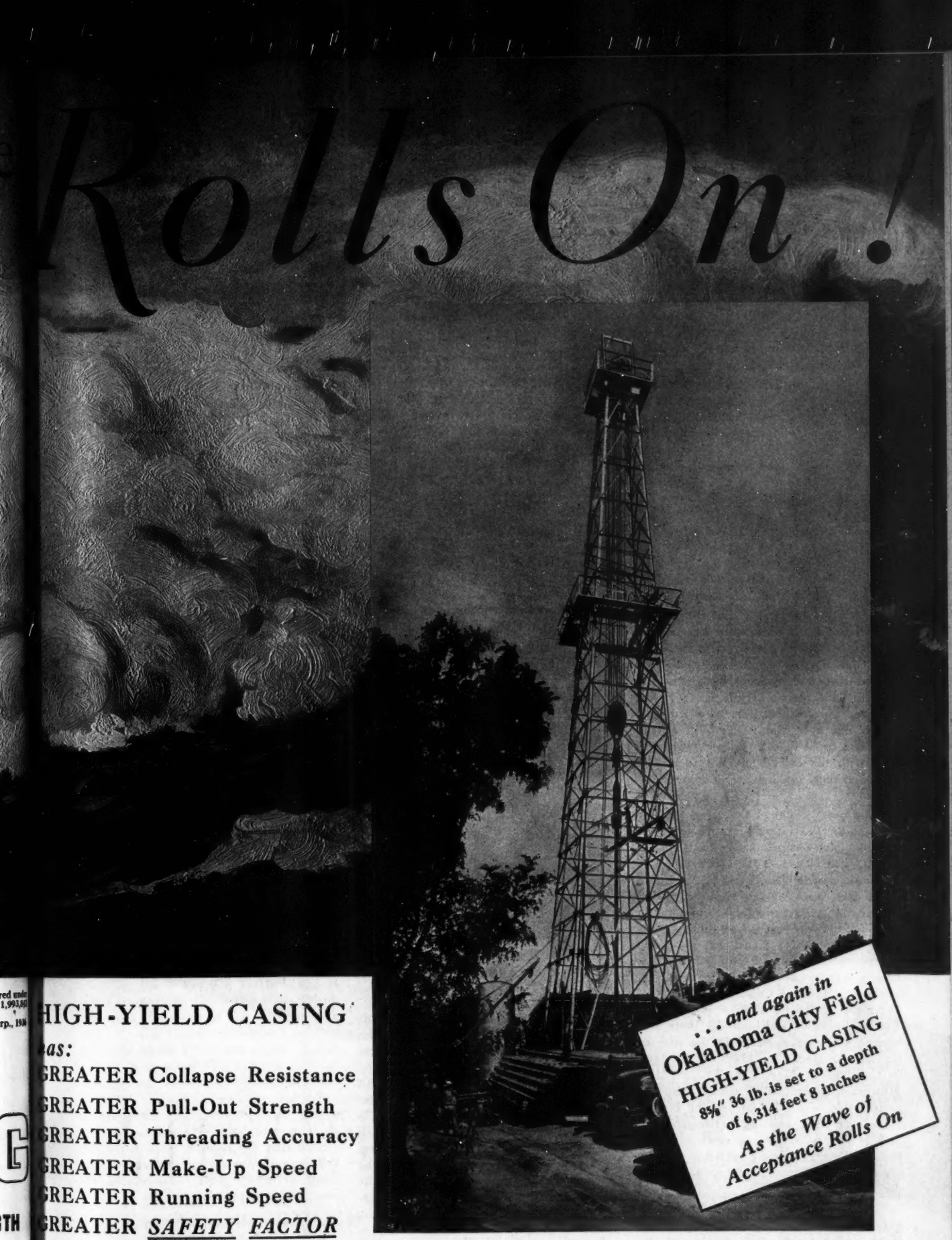

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8⅝" 36 lb. is set to a depth of 6,314 feet 8 inches
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Important Decision On Override Royalties

SUPERIOR Judge Downs on Sept. 30 rendered a decision which may help to clarify one of the difficulties which beset oil operators and title men.' This was in the case of W. L. Payne and others vs. C. B. Callahan and others, involving land in Santa Fe Springs Field.

In 1922 the oil lessee assigned an overriding royalty which plaintiffs ultimately acquired. A well was drilled under that lease, it produced for some years, ceased to produce and in 1929 the lease was quitclaimed. A new landowner had obtained title and he made a lease to a new lessee. The new lessee drilled a new well and finally placed it on production. Then this suit was brought by the holders of the overriding royalty to collect on account of this new production, suing the landowner, lessee and the purchasing companies.

Defendants contended that the surrender of the lease terminated the interest of the overriding royaltymen, although they did not quitclaim. Plaintiffs contended that under recent decisions relative to landowner's royalties, they had acquired a permanent interest in the land which not even the termination of the old lease could defeat. Judge Downs has held with the defendants, thus defeating the overriding royalties. His opinion follows:

"The court has read the cases cited by counsel on the interesting questions involved. I have concluded to base my decision in this case on the law established in Smith vs. Drake, 134 Cal. App., 700. That case is at present the law, and I feel that the same should be followed in the incident case and in all future cases until our Supreme Court has definitely overruled the same. I realize that that case cites Brookshire Oil Co. vs. Casmalia, etc., Co., 156 Cal. 211, and that the latter case, in so far as what is said relative to the rights and interests of the lessees, has been repudiated in the case of Taylor vs. Hamilton, 194 Cal. 768, and in Callahan vs. Martin, 3 Cal. (2d) 123. However, I personally believe that the relationship of the landowner and his assigns, and that existing between lessee and lessor, is not to be confused with the relationship existing between the lessee and his assignment of production under the lease.

"The case of Callahan vs. Martin, supra, very clearly sets forth the respective rights and interests of the lessor and the lessee, and the assignee of the lessor. The amounts paid by the lessee to the lessor are in the nature of rents and royalties payable to the lessor for the rights conferred under the lease. However, the interests owned by the plaintiffs herein, being assignments made by the lessee, are not in any sense to be classified as rents. No part of any amounts such assignees would receive are payable to the landowner, but are merely assignments of the production from the land, which the assignor promises and agrees to pay over to the lessor if and when received. The assignee is obligated to pay no part toward production on the land, nor is he given any rights of entry to comply with the terms of the lease or to produce oil in case the lessee refuses to act. Such an assignment is not an incorporeal hereditament, nor an interest in land in the nature of a chattel real. It endures as long as the lease upon which it is founded continues, and when the lease upon which the assignment is predicated falls, the assignee's right to participate in the production thereunder falls with it. The situation is similar to that of a tenant who leases land for a term of years, the rent to be payable out of crops grown thereon, and thereafter assigns to a third party a portion of the crops produced. The lessee surrenders the lease before expiration of the term, and another lease is made by the owner. Could the assignee claim a portion of the crops growns by the new lessee? I think not.

"Judgment for defendants."

Appearances were: For the plaintiffs, Messrs. Garten and Garten of Long Beach. For the defendants, Messrs. Pease and Dolley, and Harry E. Templeton, of Los Angeles, for all defendants other than Rio Grande Oil Co. which was represented by Messrs. H. L. Dunnigan and Gordon A. Goodwin.

■ ■ ■

F. E. O'Neal, president of El Tejon Refining Co. at Mountain Vew, met a tragic death as the result of injuries received in a minor fire at the plant two weeks ago. He lingered three days and died at 3 a. m. Sunday, Oct. 4, at Bakersfield. Mr O'Neal is survived by a widow and two small children.

■ ■ ■

DAN MILLER, Managing Engineer of The Asphalt Institute on the Pacific Coast, announces an expansion of the Institute's activity and service through the formation of a technical department in the San Francisco office. This work will be handled by J. E. Buchanan who has been appointed research engineer. The function of this department will be the collection and dissemination of data relating to the use of asphalt.

■ ■ ■

According to Frank Morgan, a professor once said to his class: "There's a young man in this class making a jackass of himself. When he is finished, I'll start."

September National Crude Yield Over 3,000,000

NATIONAL production during September appears to have averaged a little more than 3,000,000 bbls per day. Weekly scouting reports of the A. P. I. for the four weeks ended Sept. 26 showed an average of 3,024,100. The average for the last of the four weeks was 3,030,050 bbls. California's average for the four weeks is estimated by the A. P. I. as 577,550 bbls.

September production is thus shown to have exceeded the national needs, calculated by the U. S. Bureau of Mines for the month at 2,864,000 bbls., by 160,100 per day. However, the Bureau of Mines weekly reports on storage of refining crude on hand show that stocks Sept. 5 were 300,788,000 bbls. and had been reduced by Sept. 19, the last report available at this writing, to 297,950,000, a cut of 2,838,000 in two weeks. California stocks of refinable (gasoline-bearing) crude were reported by the Bureau of Mines as 31,568,000 bbls. on Sept. 5, and as 30,836,000 Sept. 19, a reduction of 723,000 bbls. in two weeks.

Declines in domestic crude stocks on hand during these two weeks were quite general. The biggest increase appears in the Gulf Coast, 175,000 bbls., while North Louisiana and Arkansas went up 39,000, and Lima-Northeast Indiana-Michigan climbed 7000 bbls. All other districts showed a drop.

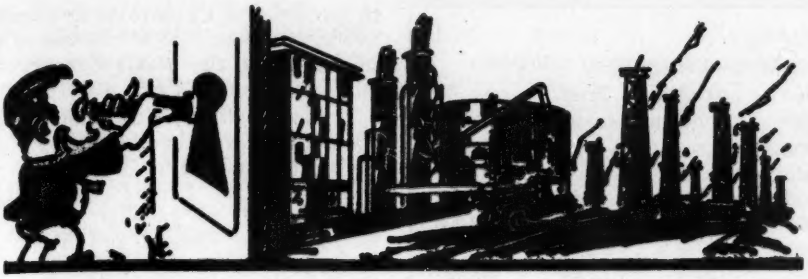
However, there was an increase of 166,000 bbls. during the two weeks in the stocks of foreign imported crude. On Sept. 19 the foreign stocks came to 2,563,000 bbls.

A. P. I. figures based on reports from companies owning 89.8% of the 3,941,000 bbl. daily potential refining capacity of the country, indicate that the industry as a whole ran to stills, on a Bureau of Mines basis, 2,990,000 bbls. of crude oil daily during the week ending Sept. 26, and that all companies had in storage at refineries, bulk terminals, in transit and in pipe lines as of the end of the week, 56,472,000 bbls. of finished and unfinished gasoline and 112,504,000 bbls. of gas and fuel oils.

Cracked gasoline production by companies owning 95.9% of the potential charging capacity of all cracking units indicates that the industry as a whole, on a Bureau of Mines basis, produced an average of 690,000 bbls. daily during the week ended Sept. 26.

■ ■ ■

G. L. Kothny, vice president and general manager of the Sperry Sun Well Surveying Co., has returned to Philadelphia from a combined business and pleasure trip to Europe.



A great many oil men are taking their vacations late in the season, to avoid the rush of people taking their vacations early in the season to avoid the rush of people taking their vacations.

■ ■

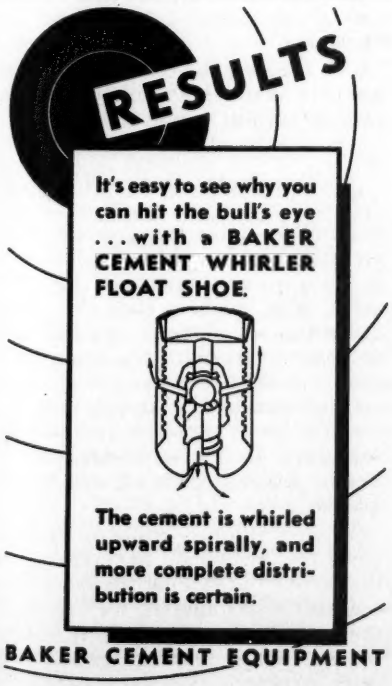
And as we come to the surface for breath, we might inform you that Bill Robinson, the program chairman of the C. N. G. A., has just returned from an extended tour in the San Joaquin Valley with a bad cold and a brand new Studebaker. Bill says they're both running swell.

■ ■

Also, be advised that Julian Campbell, back in business again, has been seen running around the oil fields with a queer looking gadget in his car, that he calls a feed-water controller and Hilo whistle. Personally, we believe the thing is nothing but a high-toned bazooka, and we suggest that Julian stay away from Bob Burns, the sage of Van Buren, if he doesn't want an infringement suit on his hands.

■ ■

At that, it's a pretty smart trick to make a boiler whistle when it needs a drink. That's the time when most of us are unable to whistle.


RESULTS
It's easy to see why you can hit the bull's eye ... with a BAKER CEMENT WHIRLER FLOAT SHOE.
The cement is whirled upward spirally, and more complete distribution is certain.
BAKER CEMENT EQUIPMENT

Now comes a report that one of George Sproule's men went out to register a while ago, and when the lady registrar asked him where he lived, he replied, "In Belvidere." The lady stiffened up, gave him a stony stare, and inquired icily, "What is your address in Belvi, please?"

■ ■

In the old days many an oil contract was sealed by the touch of glasses in the nearest saloon, and even yet some oil men go to clink.

■ ■

George Thompson, however, here interrupted to present some amazing statistics, to-wit: If all the golf balls used at the Polvadero Club last year were laid end to end, they would reach from Kettleman Hills to San Francisco—if all the caddies were locked up.

■ ■

In this same connection, Dub Russell points out that when the dove season begins, there are always a lot of oil men who shoot birdies in the American Open.

■ ■

Dub is one of the greatest students of the game on the west coast, and has developed some very interesting information about the great American obsession. For instance, he tells us that Magellan went around the world in 1521.

■ ■

Even in the old Bible days, Samson couldn't break away from the links.

■ ■

And Queen Elizabeth was always in the ruff.

■ ■

Incidentally, out at the Griffith Park courses they used to have a lot of signs, reading, "Please replace the turf," but since "John D.," Rockfellow started taking his quartet out there on Saturday mornings, they've changed the signs to read, "Please returf the place."

■ ■

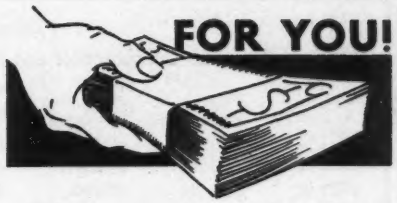
Then there was the oil man, who had trouble with his loud speaker, and had to send her out to her mother's for a week.

■ ■

Max Anfinger is of the opinion that a great many accidents are due to the fact that the steering wheel nuts are too tight.

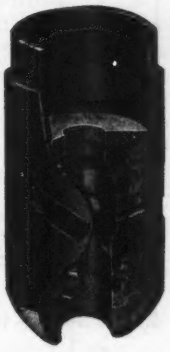
■ ■

And John Howell, in confirmation, declares that the by-products of gasoline are to be found in every hospital in the country.



When you use a Baker Cement Whirler Float Shoe, these savings are just like having money handed to you:

1. **A safe, strong Guide Shoe;**
2. **A Float Shoe suitable for "floating" any string of casing;**
3. **A "whirling" action which insures complete distribution of cement;**
4. **An internal construction of concrete and Bakelite which drills up easily and circulates out of the hole. No dangerous metal can prevent immediate coring, or deflect the bit to start an off-vertical hole.**



BAKER CEMENT EQUIPMENT

One of Max App's neighbors, so he tells us, is always lamenting the fact that he sent a boy to college for four years to make an athlete out of him, and the youngster developed nothing but an education.

■ ■

One of the most disappointing experiences in life, incidentally, is to be suddenly changed from a University graduate to a mere guy looking for a job.

■ ■

Which reminds us of the fellow who thought Wynn Lynch would give him a job as an electrician, just because he had a sixteen wart lamp.

■ ■

And Bill Saul is still wondering why the wrong numbers are never busy.

■ ■

We might mention here, by the way, that operating a switch board is neither a business nor a profession—it's a calling.

■ ■

"That was a swell shot you made this morning," says Earl Gard. "Which one do you mean?" asked Howard Thompson. "Oh, you know," replied Earl, "that time you hit the ball."

■ ■

But we just don't dare name the executive who can't get any work done because he has to go down to the street and move his automobile every forty-five minutes.

■ ■

Which brings us to the end of the weekly imposition. Don't forget that an abandoned oil well makes a swell depository for old razor blades.—R. S.

TABLE I
Gasoline Consumption and Shipments—Barrels Daily

	Pacific Coast	Pacific Foreign	Atlantic Foreign	Inter-coastal	Total
1921	31,000	1,000			32,000
1922	39,000	1,000	1,000		41,000
1923	62,000	4,000	5,000	7,000	78,000
1924	56,000	3,000	12,000	8,000	79,000
1925	75,000	6,000	10,000	27,000	118,000
1926	84,000	11,000	15,000	23,000	133,000
1927	103,000	13,000	17,000	32,000	165,000
1928	109,000	19,000	23,000	46,000	197,000
1929	119,000	23,000	32,000	64,000	238,000
1930	126,000	23,000	34,000	56,000	239,000
1931	133,000	18,000	8,000	38,000	197,000
1932	125,000	21,000	10,000	23,000	179,000
1933	123,000	16,000	5,000	31,000	175,000
1934	130,000	15,000	4,000	24,000	173,000
1935	142,000	15,000	9,000	19,000	185,000
First half 1936	150,000	17,000	9,000	20,000	196,000

Probable Future Demand for California Crude Oil

(*Continued from Page* 5)

gasoline and fuel oil inventories last year.

It is reasonable to assume that, in the main, our Pacific foreign shipments to date have been a part of our economic demand, since we have so far been the logical source of supply, but that our European and Atlantic Seaboard shipments have principally been the result of surplus production. Let us consider, therefore, what our requirements would have been during the last five and one-half years if no Atlantic foreign and Intercoastal gasoline and crude shipments had been made, on the theory that these markets were retained solely to dispose of surplus supply. It is recognized that this is a controversial point, but the fact remains that as long as Mid-Continent and certain foreign crudes have a price advantage over California, we cannot, as before stated, after absorbing the higher transportation costs, realize a price for shipments to the Atlantic Seaboard and to European markets that will return our posted price for crude.

Eliminating, therefore, the crude shipments into these markets, which are of little consequence and mainly to Europe, and the crude required to supply the gasoline shipments thereto, which, by the way, has been calculated on the basis of the gasoline yields during each of the respective years, our crude requirements, as compared with our actual production, would have been reduced to:

	Barrels Daily Requirements	Production	Surplus
1931	417,000	516,000	99,000
1932	409,000	487,000	78,000
1933	405,000	474,000	69,000
1934	416,000	481,000	65,000
1935	479,000	569,000	90,000
First half 1936	499,000	594,000	95,000

During this period, because of the surplus crude constantly pressing on the market, cracking operations in California have been at a substantially lower rate than the rest of the United States with the result that gasoline yields from total crude runs to refineries in California have been averaging around 33% whereas east of California the yields have been running around 46%.

If the gasoline yields from crude runs in California had been the same during that period as they were for the rest of the United States and we had made no gasoline or crude shipments to Europe and Atlantic Seaboard markets, our crude requirements, as compared with the actual production, would have been:

	Barrels Daily Requirements	Production	Surplus
1931	319,000	516,000	197,000
1932	307,000	487,000	180,000
1933	307,000	474,000	167,000
1934	311,000	481,000	170,000
1935	356,000	569,000	213,000
First half 1936	390,000	594,000	204,000

Obviously, if this had been the case, sales of both light and heavy fuel oils would have had to be substantially restricted because of the conversion of a larger part of the crude oil into gasoline. In this connection, however, because of the necessity of currently disposing of the crude oil being produced and because of the small quantity of gasoline extracted therefrom, it was necessary to develop markets for proportionately larger volumes of gas and fuel oils. Consequently, substantial quantities of these products were sold during the period at extremely low prices.

It is therefore obvious that a large part of our so-called demand during the last five and one-half years actually represents shipments into markets maintained solely to take care of surplus supply.

Increased Cracking

Another factor that will have a definite bearing on future crude requirements is the trend towards increased cracking. The development in automotive engines in the last three years has been such that large quantities of cracked gasoline are necessary to produce a motor fuel usable in the newer cars. If this increased cracked gasoline requirement is to be supplied by cracking residuum, then even lesser quantities of refining crude oil will be required.

While California crude oil cannot, generally speaking, be cracked to the point of producing the same percentage of gasoline as, for example, the Mid-Continent crudes, it is safe to say that if market demand and price structure were such as to jus-

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tify the cost, from 50% to 60% gasoline could be produced from California refining crude with the type of cracking equipment that can be constructed today and still leave a saleable fuel.

If, however, a larger part of our crude production is to be converted into gasoline in the future, then an equivalent quantity of existing fuel oil business will have to look to other sources of supply if our demand for products is kept in balance. In this event, the increased usage of fuel oil for cracking will materially strengthen the price therefor over what it has been during the last five or six years. From the standpoint of the petroleum industry in California, however, this is an encouraging outlook in that it will ultimately result in a higher realization to the producer since it must be recognized that the value of a barrel of crude oil is really the overall realization from its sale in the form of products.

Demand by U. S. Navy

In passing, it might be of interest to point out that during the past five years or so both the Atlantic and Pacific fleets of United States Navy have been stationed in Pacific waters. During this time the Navy has been requiring about 7,500,000 barrels annually of fuel oil. If the procedure were reversed and the major portion of the fleet were transferred to Atlantic waters, our fuel oil demand would be reduced accordingly. With the exception of steamship bunkers, the principal users of fuel oil on the Pacific Coast, however, are the railroads. The figures for 1935 are not yet available, but railroad consumption during the preceding four years were as follows:

	Barrels
1931	23,915,000
1932	17,753,000
1933	16,887,000
1934	19,704,000

With the trend toward diesel equipment, it is apparent that not only because of the increased speed but because of the materially lower fuel and operating costs that this type of equipment will come into more general use. While the petroleum industry will be called upon to supply the diesel fuel, the quantity required will be substantially less than the fuel oil consumed by the locomotives thereby displaced.

Future Requirements

The question then is, what will be our future demand, or possibly better yet, what will be our crude requirements? The American Petroleum Institute recently published an exceedingly interesting survey captioned "A Survey of the Present Position of the Petroleum Industry and Its Outlook Toward the Future." That survey, which covers the twenty-five year period, 1935-60, was prepared in cooperation with the American Association of Petroleum Geologists and the industry's experts in production, demand, transportation, refining, marketing, taxation and labor, and goes into the subject in exhaustive and elaborate detail. It recognizes the probable increases in consumption resulting from increased population, motor vehicle registration, the expansion of aviation, the greater use of buses and trucks for passenger and freight transportation, the extension of the use of diesel engines, probable improvement in the efficiency of automotive and aviation equipment and the improvement in refining technique towards increasing the available supply of motor fuel by the extension of cracking operations, hydrogenation, polymerization and the substitution of alternative fuels, etc.

From the standpoint of demand, the most outstanding point is that while motor fuel requirements are estimated to increase from 432,000,000 barrels in 1935 to 657,000,000 barrels in 1960, as a result of the forecasted steady increase in gasoline yields from crude runs, crude requirements only increase from 919,000,000 barrels in 1935 to 1,071,000,000 barrels in 1960, as follows:

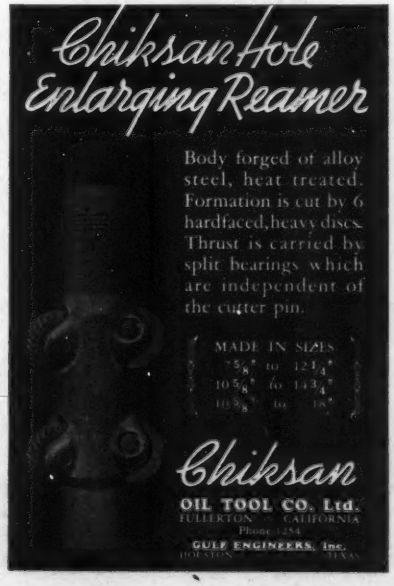
Motor Fuel Requirements Barrels	Gasoline Yield from Crude %	Crude Oil Requirements Barrels
1935..432,000,000	43.8	919,500,000
1940..563,880,000	48.0	1,099,000,000
1945..599,900,000	51.0	1,104,080,000
1950..636,570,000	54.0	1,109,800,000
1955..647,160,000	56.0	1,087,930,000
1960..657,490,000	58.0	1,071,020,000

It is appreciated that the future outlook for the expansion and development of the Pacific Coast is not comparable with the United States as a whole, that we do not have the closely populated areas as in the East, that our farming lands are not as fully developed as in the Middle West, that we do not have the same condition of non-users of motor fuel as exists in the metropolitan areas of the East and in certain sections of the South. We should consequently be justified in looking forward to a greater increase in motor fuel consumption on the Pacific Coast during the next twenty-five years than has been forecast for the United States. Assuming, however, that our increase is only at the same rate as forecast for the United States, that we retain only our existing Pacific foreign business of both gasoline and crude oil and that our gasoline yields were increased to the same percentage as set forth in the American Petroleum Institute report under discussion, our future outlook would be as shown in Table II.

In connection with the foregoing indicated crude requirements, it will be recalled that our crude oil pro-

TABLE II

	Gasoline Demand—Bbls. Daily			Crude Requirements—Bbls. Daily		
	Pacific Coast	Pacific Foreign Shipments	Total	To supply gasoline demand	Pacific Foreign Shipments	Total
1940	184,000	15,000	199,000	348,000	39,000	387,000
1945	196,000	15,000	211,000	346,000	39,000	385,000
1950	207,000	15,000	222,000	345,000	39,000	384,000
1955	211,000	15,000	226,000	338,000	39,000	377,000
1960	214,000	15,000	229,000	332,000	39,000	371,000


Chiksan Hole Enlarging Reamer
Body forged of alloy steel, heat treated. Formation is cut by 6 hardfaced, heavy discs. Thrust is carried by split bearings which are independent of the cutter pin.
MADE IN SIZES
7 5/8" to 12 1/4"
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duction is now averaging around 580,000 barrels daily.

Numerous estimates have been made by qualified petroleum engineers, the California Oil Umpire's Office and the American Petroleum Institute which set the future developed crude oil reserves of California between two and three quarter billion and three and one-half billion barrels. It is recognized that such estimates have to be predicated entirely on known existing fields, sands and structures and, consequently, have to be constantly revised. Using three billion barrels, however, as a basis, our reserves are sufficient to supply the foregoing indicated requirements for about twenty years. If the Pacific foreign shipments were also eliminated, which, of course, could not be done until the current crude oil production was reduced to Pacific Coast requirements, this reserve would be sufficient to supply the Pacific Coast requirements for about twenty-five years. At the same time, as a result of increasing our gasoline yields from the present 33% to 48% in 1940 and then to 58% by 1960, we would, as before discussed, be required to substantially reduce our fuel oil business. On the other hand, if we continue our present rate of consumption, our reserves, on the basis of three billion barrels, would be depleted in about fifteen years, provided of course, the oil could be produced in so short a period.

It would, therefore, seem that unless some undiscovered flush fields or deeper sands of large importance are presently developed in California, our question is answered. That the future demand for California petroleum products will be as in the past, our available supply, but that in the future it will not include the disposition of a surplus over and above our economic markets.

Present Reserves

Therefore, if present estimates of California reserves closely approximate the ultimate recovery, then we will within a very few years see the entire elimination of shipments to Europe and the Atlantic Seaboard and will also see a material reduction, if not an entire elimination of shipments to Pacific foreign markets. This should not be viewed, however, with alarm but as an optimistic outlook for the California producer and, in turn, the people of the State by reason of the greater revenue that will be possible from the utilization of California's most important natural resource.

As to supplying our own requirements, there should be no fear as to a shortage, for as before mentioned, the present day refinery methods are such that, if necessary, a considerably larger portion of our crude supply can be converted into motor fuel, which is the most important product. Furthermore, it is generally accepted that future improvements in refinery engineering will, if required, provide an even larger recovery than is now possible.

Possible shortage of petroleum in California, however, is not a new story. Quoting from a booklet published in 1928 by Chamber of Mines and Oil, the forerunner of the present California Oil and Gas Association, "The year 1900 was of further importance because it headed a 7-year period of over-production. *** By 1906, when the state's output had climbed to over 32 million barrels, oil was generally adopted as a locomotive fuel. This not only brought relief but soon caused consumption to overtake and exceed production. The shortage however, was ended in 1909, when the state's production increased to 58 million barrels.***The Coyote and Whittier fields became heavy producers in 1912, and in 1914 the total state production reached the record figure of nearly 104 million barrels. Immediately thereafter, production showed a sharp decline and it was not until six years later that the record of 1914 was again equalled. In the meantime reserve stocks of crude oil were drawn upon steadily, so that when the United States entered the World War in 1917 the increased demand for petroleum threatened to create a shortage in California***Some relief was effected by the discovery of the Montebello field in 1917, and by heavy production in the Richfield and Elk Hills fields in 1919. Production continued to lag, however, until 1920, when Montebello, Elk Hills, and Richfield added 21 million barrels to the state's output. By this time reserve stocks of crude had been reduced to 22 million barrels.***"

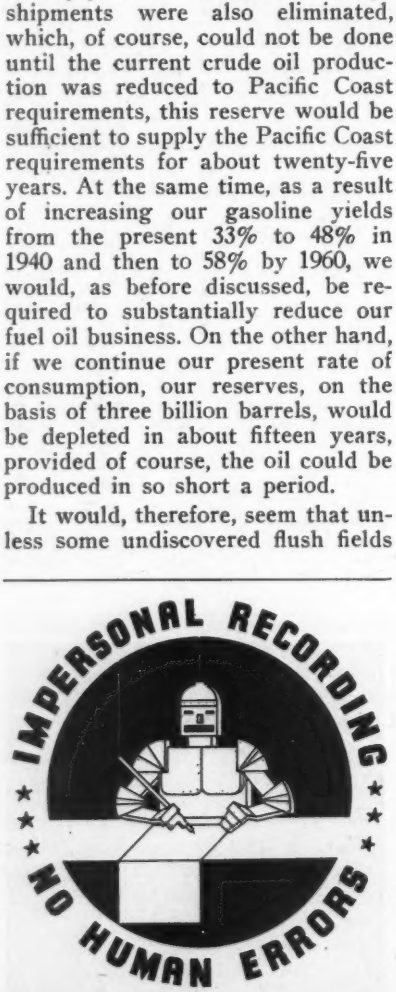
We were so alarmed because of the 1920 shortage of crude oil that train loads of gasoline were shipped into this territory from the Mid-Continent and cargoes of crude naphtha were imported from Mexico. This was all changed by discovery of new fields, such as Santa Fe Springs in 1923, which produced in that year alone eighty million barrels of crude oil as compared with a total of one hundred and four million barrels for the entire state in 1920.

A graphical picture of the foregoing is set forth in the chart appended hereto. This chart illustrates since 1914 the close relationship between production and indicated demand, the fluctuation in total stocks and in the price structures for crude oil, gasoline and fuel oil, and the effect that shortage and surplus of supply have had on the price structure.

■ ■ ■

PROMINENT among oil executives from New York who recently visited Los Angeles, San Francisco, Portland, Seattle and other points on the Pacific Coast were F. E. Whitesell, manager of automotive lubrication sales for Socony-Vacuum Oil Company, and C. B. White, of the same department of that world-wide organization. They were on the coast conferring with H. W. Taylor, manager of the lubrication department of General Petroleum Corporation and other officials of this far western affiliate of Socony-Vacuum.

In an interview given in Los Angeles, Mr. Whitesell referred to the marked improvements in high speed cars produced by American automobile manufacturers, and the important part played by regular lubrication and oil changing in operating these cars at the peak of efficiency, with a minimum of repairs.



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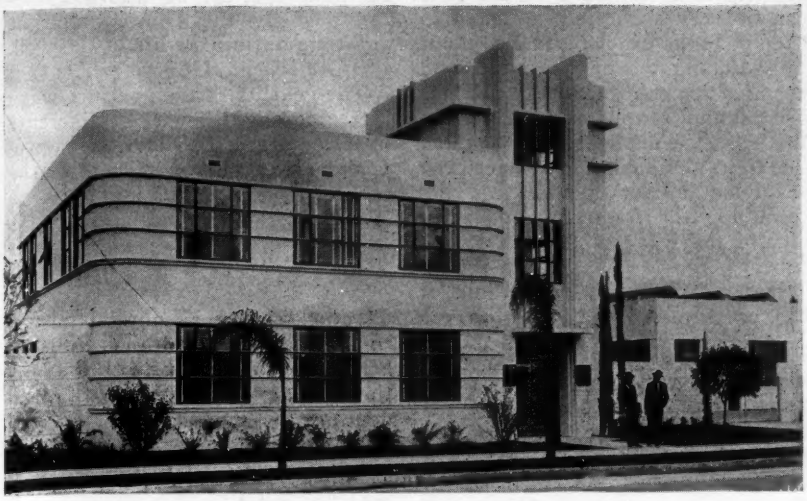

Lane-Wells Occupies New Building

"GROWING Pains" have finally compelled The Lane-Wells Co. to build in Los Angeles a brand new home, to house the general offices and plant of both The Lane-Wells Co. and Technicraft Engineering Corp. The latter is the new development division of Lane-Wells.

The new buildings are strategically located on four acres of land in the newer industrial district of Los Angeles, at 5610 South Soto Street.

The main building is ultimately for the use of Technicraft only, but for the present will also house The Lane-Wells Co. The Lane-Wells Plant building is at the right rear, and will be fronted later by a separate office building.

Here are a few highlights on the construction and equipment: Technicraft Bldg., first floor, 7,000 sq. ft., of which 4,000 for offices and 3,000 for shops and laboratories; second floor, 2,350 sq. ft., executive offices and technical library; third floor tower, club room. Lane-Wells plant proper, 11,520 sq. ft.

Construction of all buildings is reinforced concrete, with over-supply of steel to guarantee against earthquake. The concrete has an architectural finish obtained by use of special panels in forms. Inside walls have a polished treatment, and ceilings are of accoustical material to kill echoes.

A modern air-conditioning plant, with auxiliary gas furnace takes care of cooling, humidifying and heating.

The lighting is of special interest: 90% north lighting through sawtooth skylights, combined with ultra-modern mercury vapor lights throughout — "full indirect" type in office and labs, and "direct diffused" type in plant . . . Venetian blinds give further lighting control.

Unusual recreational and health facilities are provided for both plant and office employees: Courts for tennis, hand-ball and badminton (flood lighted for night use) and generous showers, lavatory and locker-room facilities.

Two acres of the property have been made ready as a playground for underprivileged children and to provide a cabin site for the Boy Scouts. These activities will be supervised by the Rotary Club of Huntington Park, of which "Bill" and "Walt" are both members.

The latest inter-communication system links all parts of the plant and offices, with code-calls sounded on xylophone bells. Separate garage facilities permit the storage or repairs on 8 service trucks, besides accommodating 17 office cars. General contractor on the entire job was Robert E. Millsap, under the supervision of Charles H. Barnes, Assistant Chief Engineer of The Lane-Wells Co.

Naturally, Lane-Wells is mighty proud of their new building, but they aren't forgetting that your business, Mr. Customer, has made it possible. So they want you to remember that their home is your home whenever you are in Los Angeles. To those who would like to look over the new plant a hearty invitation to do so is extended during a "Welcome Week" . . .. October 17 to 24.

■ ■ ■

R. A. (DICK) SPERRY, vice-president of General Petroleum Corporation, J. P. (Jack) Samuelson, land controller, and W. B. (Red) Pyles, manager of the transportation department of this company, have been receiving congratulations on the winning of a number of coveted prizes in the Pioneer Days parade, held recently in Bakersfield.

■ ■ ■

Dave Kilgore: "How did you come out at the dog race? Did your dog win?"

Frank Rehm: "No, he was left at the post."

California Production 589,950 Bbls. Per Day

THE average production of California for the week ending October 10, according to the California Oil World estimate, was 589,950 barrels per day, a drop of nearly 10,000 barrels per day from last week's average. As this average was based upon the production made during the final days of the previous month, and only two days of the current month, it is a natural consequence, as during the latter portion of the month the operators were producing at the absolute minimum, having made their allotment for the month. The first two days of the current month, production jumped 46,500 barrels, which was considerably higher than was anticipated.

CALIFORNIA DAILY CRUDE PRODUCTION
California Oil World Estimate

	Week Ended Oct. 10 1936	Week Ended Oct. 3 1936	Week Ended Oct. 12 1935
Long Beach	66,150	65,000	78,150
Santa Fe Springs	45,250	42,300	54,600
Huntington Beach	36,375	34,250	43,700
Seal Beach	8,560	9,500	8,950
Inglewood	12,300	10,300	17,030
Torrance	8,500	8,560	6,950
Dominguez	23,500	24,850	21,400
Rosecrans	2,400	1,880	2,550
Del Rey	11,550	11,850	17,300
Lawndale	95	90	115
Potrero	270	270	325
L. A. Basin Totals	**214,950**	**208,850**	**251,070**
Ventura Avenue	34,550	33,800	33,800
Elwood	11,250	11,000	13,900
Rincon	2,100	2,100	2,370
Kettleman Hills	77,500	77,700	94,200
Belridge	16,000	15,500	10,250
Midway-Maricopa	37,300	35,350	36,120
Rest of State	196,300	167,050	202,560
STATE TOTALS	**589,950**	**551,350**	**644,270**

In comparing the average production for the same period of the year 1935, it will be noted that current production is running considerably less, about 55,000 barrels per day, than it was for a similar period a year ago.

■ ■ ■

THE American Petroleum Institute reports that the industrial fatality rate of the industry has decreased from 76.3 in 1928, to 37.0 in 1935. The severity rate has decreased from 2.65 in 1927, to 1.55 in 1935, and the frequency from 31.15 to 14.31 for the same period.

The petroleum industry has shown what can be done when an industry decides that the number and severity of accidents must be decreased.

■ ■ ■

Wendell Jones: "Do you know a time will come when women will receive men's wages?"

Albert Kelly: "Sure, next Saturday night."

The Depthograph, a New Production Instrument

(*Continued from page* 9)

echoes from the well. The light beam from the mirror is directed upon a revolving mirron with eight reflecting faces. The oscillations of the pressure wave in the calibrating tube cause the light beam to vibrate parallel to the axis of the revolving mirror. When the mirror is rotated the light beam is moved at right angles to the movement imparted to it by the oscillations in the tube. This resultant motion of the beam is observed upon a ground glass and represents the form of the wave which is oscillating in the tube. When the condition of perfect resonance occurs in the tube the amplitude of this wave reaches a maximum and its shape is quite critical. If the frequency of applying the impulses to the tube is varied slightly from the natural period of the tube the wave as seen upon the ground glass undergoes a radical change in shape and its amplitude is diminished.

Oscillation Intensity

As the intensity of oscillations in the tube is a maximum when perfect resonance occurs in it a device for indicating the intensity of the pressure wave oscillating in the tube makes a simple means for determining when the rate of application of the impulses to the tube is such that the tube is in resonance. For indicating resonance by this method a microphone is attached to one end of the tube where it can pick up the wave oscillations and pass them on to an amplifier. The amplifier output meter gives an accurate indication of resonance in the tube. The tuning is very sharp and the rate of application of impulses to the tube can be very accurately adjusted to keep it at the exact resonance point by watching the output meter and keeping this rate such as to produce a maximum output as indicated by the meter. This electrical method, due to its simplicity has replaced the revolving mirror method for determining the frequency and velocity of the wave in the calibrating tube.

However, the determination of the pressure wave velocity in the wells from tubing catchers or reflectors installed in the well above the fluid level is more accurate than the indirect method of measuring the velocity in the calibrating apparatus and it is recommended that this method be used where the fluid level is low and a high degree of accuracy is required. Some oil companies are now making it a practice to install a wave reflector in the well above the static fluid level the first time the tubing is pulled. This provides a permanent yard stick in the well by means of which the fluid level can be accurately determined by the Depthograph at any time during the life of the well.

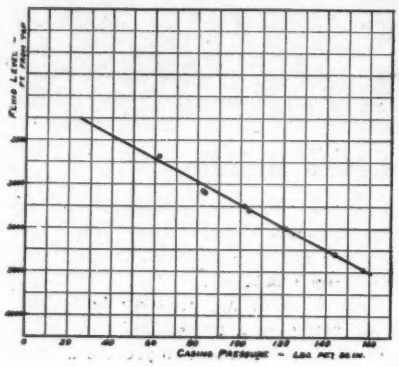

Fig. 4—

Fluid level receded 1 *ft. for each* 0.216 *pound per sq. inch of pressure increment at the fluid surface.*

Mathematical Consideration

The velocity of the pressure wave increases slightly with an increase in temperature. This increase is proportional to the square root of the absolute temperature, or

$$\frac{V_1}{V_2} = \left(\frac{T_1}{T_2}\right)^{\frac{1}{2}}$$

T^1 and T^2 being absolute temperatures. Figure 2 is drawn from an actual test in a well and shows how the velocity increases with well depth and temperature. This well had two tubing catchers in it and a reflector was installed on the tubing between the two catchers providing three markers in the well from which the variation in wave velocity with depth could be determined.

Several wells with a wide variation in gas gravity and quantity of gas and containing two or more wave reflectors from which the wave velocity at different depths in the wells could be determined have been tested and in all of them the velocity-depth gradient has been found to be constant for the full depth of the wells.

If the reflector which is being used to determine the wave velocity in the well is not too far above the fluid, the fluid level can be determined quite accurately by using the mean wave velocity to the catcher. If the fluid is very far below the catcher the mean velocity to it, due to the higher temperature, will be slightly greater than that to the catcher, in which case it will be necessary to make a slight correction in the velocity to the catcher before using it to determine the distance to the fluid.

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Specialists in Motor Transportation and Pipe Line Construction

MIKE LANG, President

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LOS ANGELES, CALIFORNIA

By observing the reflections on the ground glass of the Depthograph when fluid level tests are being made the operator is able to determine the approximate distance from the reflector to the fluid. If the distance is too far to determine the fluid level from the catcher reflection by straight proportion the temperature of the gas flowing from the well is measured. Having this temperature and knowing the average bottom hole temperature for the field in which the well is located the slope of the velocity-depth curve for the well can be determined.

Knowing the gas temperature at the top and the estimated temperatures at the reflector and the fluid surface, and the average velocity to the reflector, as determined from the Depthograph chart, the average velocity to the fluid is

$$Vmf = Vmr \left(\frac{460 + Tmf}{460 + Tmr}\right)^{\frac{1}{2}}$$

Where Vmf = mean velocity to the fluid. Where Vmr = mean velocity to the reflector. Where Tmf = mean temperature to the fluid in degrees F. Where Tmr = mean temperature to the reflector in degrees F.

The mean velocity to the fluid thus determined multiplied by the seconds to the fluid as shown on the Depthograph chart will give the distance to the fluid. As the velocity correction for temperature is very little an error in the assumed bottom hole temperature will result in a negligible error in the fluid level determination.

The Depthograph has been used principally for making fluid level surveys of groups of wells in a field. It is, however, finding increased use as an aid in solving difficult pumping problems.

In wells producing large quantities of gas the fluid is seldom as dense within the well during production as it is in a sample drawn from the well and from which the gas has been allowed to escape. Fluids made light in the well by gas are difficult to pump at satisfactory volumetric efficiencies even though a good conventional gas anchor may be used.

Many wells have been pumped at low volumetric efficiency because it could not be determined whether there was a lack of fluid in the well or whether the fluid was too light for the pump to handle efficiently. The Depthograph has been used in many cases of this kind to determine the real reason for low pump volumetric efficiency.

If considerable height of fluid is found above the pump in these high gas-oil ratio wells the casing is closed in and the pressure allowed to build up to some predetermined value. When this pressure is reached the gas flow line valve is cracked and the pressure held at the desired value for several hours or until the fluid level has ceased to recede. The level is then photographed and its location determined.

The total pressure holding the fluid down during this test is the sum of the static head due to the weight of the gas column above the fluid and the casing pressure at the top of the casing. Dividing this total pressure by the distance in feet through which the fluid has receded gives the average density of the fluid in pounds per square inch per foot of static head.

To determine the density of the fluid at different distances above the pump this back pressure operation is sometimes repeated several times. As the well should be pumped until the level ceases to recede after each step of casing pressure it is seldom that more than one step can be completed in one day unless the casing is small and the quantity of gas large which will permit making determinations more often. Figures 3 and 4 show fluid level curves plotted from such tests. The data for Figure 3 curve was obtained from a well in which the fluid was of normal density while the curve shown in Figure 4 was plotted from data taken from a well where the fluid was about 50% of normal density. Tests have been successfully made in wells where the fluid weight was as low as four to five pounds per square inch per 100 feet of height.

In measuring fluid levels in high gas-oil ratio wells the fluid is usually made dense by building up casing pressure in one or more steps and instead of reporting fluid level in feet from the top, the pressure at the pump is determined and reported. The pressure at the pump consists of the casing pressure, the weight of the gas in the casing and the static head of fluid above the pump.

As the Depthograph has been in use only a few months and something is learned about its use in practically every oil field in which it has been used it is felt that it may have many possibilities which have not yet been discovered.

Hurndall Tests Pyramid Well

JOHN P. HURNDALL is testing the well on sec. 16, 24-18, Pyramid Hills, originally drilled by the Royalty Service Corp. to some 4200 ft., after having backed up and plugged to 1991. After reperforating the casing at this point the well has yielded a great quantity of rotary mud, some water and a little oil. Until the mud has been cleaned out nothing can be determined as to the well's commercial possibilities.

Mr. Hurndall has under consideration the drilling of a second well within another 60 days but no decision has been reached on this point. If the new well is drilled it may be carried down to the sand reached by Royalty Service at 4200 ft. This sand was not tested, the reason being, according to current field rumors, the refusal of the home office in Oklahoma to spend any more money on the location.

■ ■ ■

Chappuis Enters Premier

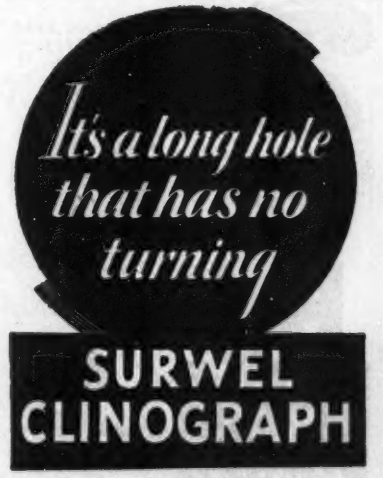
LOUIS CHAPPUIS, who has has been drilling at Maricopa, has extended his field of operations to the Premier area on the east side of Kern county. He will drill his first well at a location staked on sec. 29, 27-27. Another Premier area well will be drilled by the Framac Oil Co. on sec. 22, 27-27.

■ ■ ■

Dick Morrison dove in and come out with this one:

Judge: "Did you kill this man?"

Accused: "Yer honor, I'll be hanged if I did."



Sperry-Sun Well Surveying Co.

1036 Walnut Street, Philadelphia, Pa.
Long Beach, Calif.
540 East Bixby Road (3800 Block, Atlantic Ave.)

National Separator To Be Manufactured in California

THE National Oil & Gas Separator, heretofore manufactured in Tulsa exclusively, is now being manufactured and sold in California by American Pipe & Steel Corporation.

The National Oil & Gas Separator has enjoyed great popularity in the Mid-Continent due to its high degree of efficiency,

moderate cost, and low upkeep.. National Separators make use of all the known principles of separation. The gases are expanded three different times, scrubbed centrifugally against four different walls, scrubbed once through perforations and impinged on walls.

The moving gas passes through successive stages of separation and oil that is separated out of the gas is directly drained away and never again enters the path of the moving gas.

The unique scientific design of the National Separator makes it possible to put large volumes of oil and gas through a comparatively small separator and for a separator of large capacity to handle a small volume of oil and gas as efficiently as large vlumes. There is no critical point in its capacity above or below which it does not separate efficiently.

National Separators with the proper controls are available for any separating condition whether it be high or low pressure, large or small volumes of oil and gas.

National Oil & Gas Separators assure all the results desired of a separator; namely, complete separation of oil and gas, dry gas for any use, quiet oil and less gas in stock tanks, low or high pressure separation as desired, large oil and gas capacity and simple and economical operation.

■ ■ ■

New California Representation For Gardner-Denver Company

THROUGH its California manager, G. V. Leece, the Gardner-Denver Co. has announced that, effective Oct. 15, it has somewhat realigned its sales outlets in California, with the appointment of Wagner Sales and Service, Inc., together with the Republic Supply Company of California, as exclusive California dealers for Gardner-Denver slush pumps and drilling engines. The Republic Supply Company remains as exclusive distributor for the company's oil line and trade pumps, an arrangement that has been in effect for some time.

Wagner Sales and Service, Inc., is headed by Chas. D. Wagner, whose experience in California in the oil well supply business has covered many years.

■ ■ ■

Torrey Webb says a neighbor's daughtor was enthusing about the hot swing music being ground out by the radio.

"Did you ever hear anything so perfectly wonderful?" she raved.

"No," replied her father, "I can't say I have, although I once heard a collision between a truck load of empty milk cans and a freight train filled with live ducks."

■ ■ ■

R. J. Eiche, foreign representative for several California supply companies, is leaving this week for a trip to the northern part of South America. He plans to visit Venezuela, Colombia, Trinidad, and Curacao.

Drilling Report

Oil field operations reported during the week ended Oct. 3, show 22 notices to drill new wells filed, as compared with 21. 2 were in Huntington Beach, 1 each in Long Beach, Montebello, Rosecrans, Torrance, 1 in Los Angeles County, 1 in Piru, 13 in Kern county, and 1 in Kettleman North Dome. Total new wells, 639, as compared with 775 at the same date last year.

Deepening or redrilling jobs numbered 7, as compared with 12. Total to date, 625; total to same date last year, 624.

Abandonments numbered 6, as compared with 5. Total to date, 350; same date last year, 298.

	Well No.	S.	T.	R.
New Wells				
Torrance				
Gus Pongratz				
Vaccaro	2	8	4 S	14 W
Long Beach				
Shell Oil Co.				
Alamitos	43	29	4 S	12 W
Huntington Beach				
W. M. Elliott Co.	1	2	6 S	11 W
Westport Oil Co.	5	2	6 S	11 W
Los Angeles County				
Universal Cons. Oil Co.				
Carrell	1	36	3 S	14 W
Montebello				
Standard Oil Co.				
Baldwin	89	1	2 S	12 W
Rosecrans				
Santa Rita Oil Co.				
Santa Rita	1	20	3 S	13 W
Piru				
Pacific Western Oil Corp.				
Temescal	6	4	4 N	18 W
Sunset				
Union Oil Co.				
Midway Northern	1	7	11 N	23 W
Lost Hills				
West Coast Oil Co.	6-L-3	2	26 S	20 E
Midway				
Standard Oil Co.	8	33	32 S	23 E
Union Oil Co.				
Keene	3	22	32 S	23 E
Williams	2	22	32 S	23 E
Kern River				
McDonald and Dearin	3	11	28 S	27 E
Hope Oil Co.				
Golden Rod	6	8	29 S	28 E
Mt. Poso				
Shell Oil Co.				
Security	18	16	27 S	28 E
Vedder	30	9	27 S	28 E
Round Mountain				
Shell Oil Co.				
Freeman	11	20	28 S	29 E
Olcese 1	7	17	28 S	29 E
Mountain View				
Standard Oil Co.				
Mabry	2	18	30 S	29 E
Fruitvale				
W. F. Higgins				
Higgins	10	21	29 S	27 E
Kettleman North Dome				
Kenda	81	32	21 S	17 E
Deepen or Redrill				
Long Beach				
D. W. Elliott, Inc.	1	30	4 S	12 W
The Texas Co.				
MacDavid	1	29	4 S	12 W
Huntington Beach				
Union Oil Co.				
Copeland	5	34	5 S	11 W
Bardsdale				
The Texas Co.				
Shiells	131	4	3 N	19 W
Santa Maria				
Union Oil Co.				
Squires	12	26	9 N	34 W
Elwood				
Barnsdall Oil Co.				
Doty	2	15	4 N	29 W
Midway				
Standard Oil Co.	21	15	32 S	28 E
Abandon				
Long Beach				
Keystone Western Oil Co.	2	29	4 S	12 W
Kiowa Petroleum Corp.				
Kiowa	2	30	4 S	12 W
Santa Barbara County				
Channel Oil & Development Co., Ltd.	1	..	4 N	27 W
San Luis Obispo County				
Union Oil Co.				
Union Sugar	2	..	10 N	35 W
Arroyo Grande				
Birch-Royer Oil Co.				
B. E. Patchett	1	33	31 S	13 E
Kern River				
Union Oil Co.				
7. Perseus	1	11	28 S	27 E

■ ■ ■

Don Dawson (doubtfully, to public stenographer): "Do you retire a loan?"

Wistful one: "No, I sleep with mamma."

Union Oil Earnings Increase

UNION OIL COMPANY of California reports for the nine months ended September 30, 1936, a net profit of $4,400,000 equivalent to $1.00 per share on the 4,386,070 shares outstanding. This is after all charges including general expenses, taxes (including income taxes), interest charges, etc., and provision for depletion and depreciation with no provision necessary for Federal Surtax on undistributed profits under the Revenue Act of 1936. These earnings compare with $4,000,000 and 91c per share for the nine months ended September 30, 1935. Net profits for the third quarter, which are the highest since 1930, totaled $2,400,000 or 55c per share as compared with $1,050,000 and 24c per share for the same 1935 period and $1,600,000 and 36c per share for the second quarter of 1936.

Mr. L. P. St. Clair, president, in his comment on the earnings, stated that "The increased profits for the past three months as compared with the second quarter of this year and the third quarter of last are due principally to increased production and sales volume together with better prices prevailing for products, gasoline prices having been extremely low in the third quarter of 1935, and continuing thereafter until April of 1936."

Profit subject to depreciation, etc., for the nine months ended September 30th was $10,800,000 or $2.46 per share, as compared with $9,650,000, or $2.20 per share, in the corresponding 1935 period. Provision for depletion and depreciation was $6,400,000 as compared with $5,650,000, equivalent to $1.46 a share and $1.29 a share, respectively.

Production, subject to royalty, of crude oil and natural gasoline for the nine months approximated 15,150,000 barrels, as compared with 12,950,000 barrels for the same period in 1935.

Sales for the nine months amounted to $48,200,000, an increase of $550,000 over the corresponding period last year. The quantity sold was 22,900,000 barrels, as compared with 23,400,000 for the nine months of 1935. Sales of products during the third quarter totaled 8,200,000 barrels, as compared with 7,050,000 barrels for the corresponding period of 1935.

Capital outlay approximated $5,300,000, consisting mainly of expenditures for field development and for improvements and additions to other facilities.

Current assets, consisting of cash resources, accounts and notes receivable, oil inventories and materials and supplies, approximated $43,600,000, an increase of about $1,700,000 over December 31, 1935. Cash resources approximated $11,900,000. Current assets at September 30th were almost 6 to 1 of current liabilities.

Current liabilities approximated $7,500,000, an increase of $1,150,000 since December 31, 1935.

Funded debt at September 30th totaled $20,326,500, a decrease of $1,200,000 from December 31, 1935.

At the regular meeting of the Board of directors a dividend of 25c per share was declared payable November 10th to stockholders of record October 17th.

■ ■ ■

Allen Crary has two madcap aviator friends who recently started to fly from Los Angeles to San Francisco. Just before leaving town they offered to give a couple of Hollywood blondes a lift to San Francisco in their new plane. Unfortunately the plane caught fire over the ridge and the first man slipped into one of the two parachutes and started to bail out.

"Wait a minute!" yelled the other. "Aren't you forgetting the women?"

The first pilot turned around hesitantly, "Do you think we'll have time?" he asked.

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For Foreign Countries, $2.00

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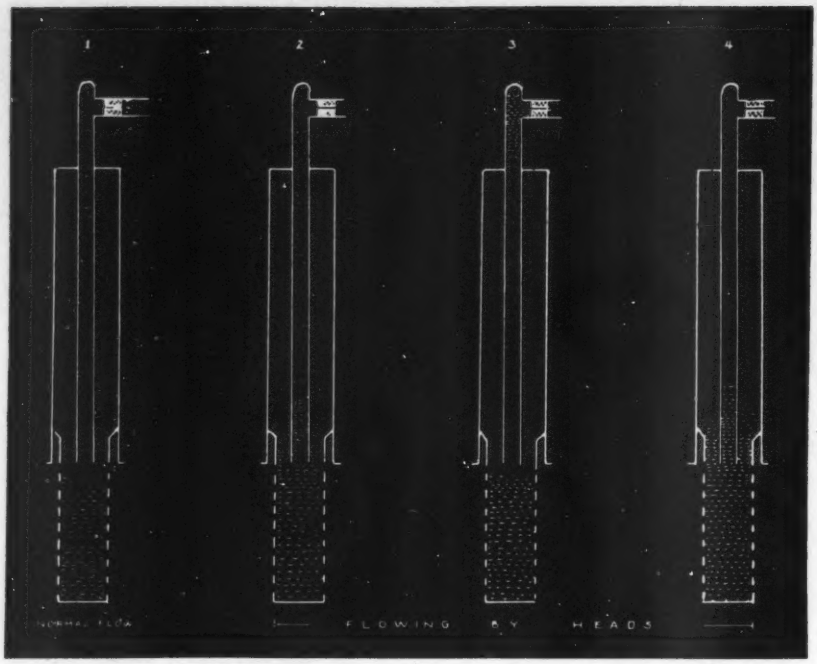

Showing Effect of Flow Restriction

Use of Flow Bean

(*Continued from Page* 6)

up the tubing. This tends to restore a condition like Figure 1, except that due to increased back pressure from the smaller bean, the rate of production will be lower.

Indirect Method

It is apparent that beaning at the surface is rather an indirect method of accomplishing the purpose. If the bean were at the bottom of the tubing, it would act much quicker and be much more favorable to continued flow, because not so much resistance would be necessary to steady the well. It has other advantages also but the great difficulty of installing and changing such beans has prevented their becoming very popular.

Another method that is in considerable use is that of installing a packer on the bottom of the tubing. By sealing off the space between tubing and casing it prevents oil and gas from accumulating in this space and tends to prevent heading. Thus it lengthens the flowing life.

6. A use of beaning that is rather modern is that of improving the gas-oil ratio. Gas-oil ratio is defined as cubic feet of gas per barrel of oil produced. Gas, by its expansion, is the chief agent bringing oil into the well, at least during flush production. It is also necessary in lightening the weight of the oil column, so that the formation pressure can flow it to the surface. It is desirable to conserve in the ground the extra amounts not necessary in producing the well. Sometimes careful beaning will reduce the ratio of gas produced with the oil, so that a larger amount of oil will ultimately be produced by flowing. Occasionally the opposite is the case and the lowest gas-oil ratio is obtained by reducing the back pressure as much as possible. There is usually one rate of flow which has the lowest possible gas-oil ratio. Lower and higher rates will give a higher ratio.

In special cases, the well may be beaned at the oil and gas separator. One case is where stage separation is used. Most of the gas is drawn off and run through the gasoline plant from a separator operating at well pressure. This makes compression unnecessary. One or more lower pressure stages are then necessary to separate all the available natural gasoline and gas from the oil.

This is a problem where the interests of the oil producer and gasoline man overlap. It offers an excellent opportunity for cooperation for their mutual benefit.

In determining when and how much to bean, a great deal depends on experience and knowledge of the behavior of the oil zone. Aside from these, probably the most valuable aid to diagnosis is a wet gas meter on each flowing well. Lacking this, recording pressure gages or tubing and casing and an accurate estimate of gas production are necessary.

Production engineers and even some production foremen find an inspection of the gas charts yields valuable information. The installation of separate meters for each flowing or gas lift well will almost always be a good investment, even though it may seem unnecessary to the gas or gasoline man.

Editor's Note: The above paper was presented at the September 10th monthly meeting of the California Natural Gasoline Association. The Chairman of the meeting invited comments upon the paper, after presentation, and particularly called upon Mr. Hallan Marsh, production engineer for the General Petroleum Corporation. The comments of Mr. Marsh follows:—

As Mr. Davis has said, a bean is nothing but an orifice. Its purpose is to dissipate energy. In one well measurements showed a dissipation of 1390 horsepower at the bean. That is a lot of energy to be absorbed right in one spot, and perhaps explains why beans do cut out very rapidly, even though made of very hard metal. In another case, according to hearsay data, the horsepower dissipated by the bean was about 27,000.

Mr. Davis has outlined and illustrated the common types of beans. The most common type, the fixed bean, is simply a hole through a plug

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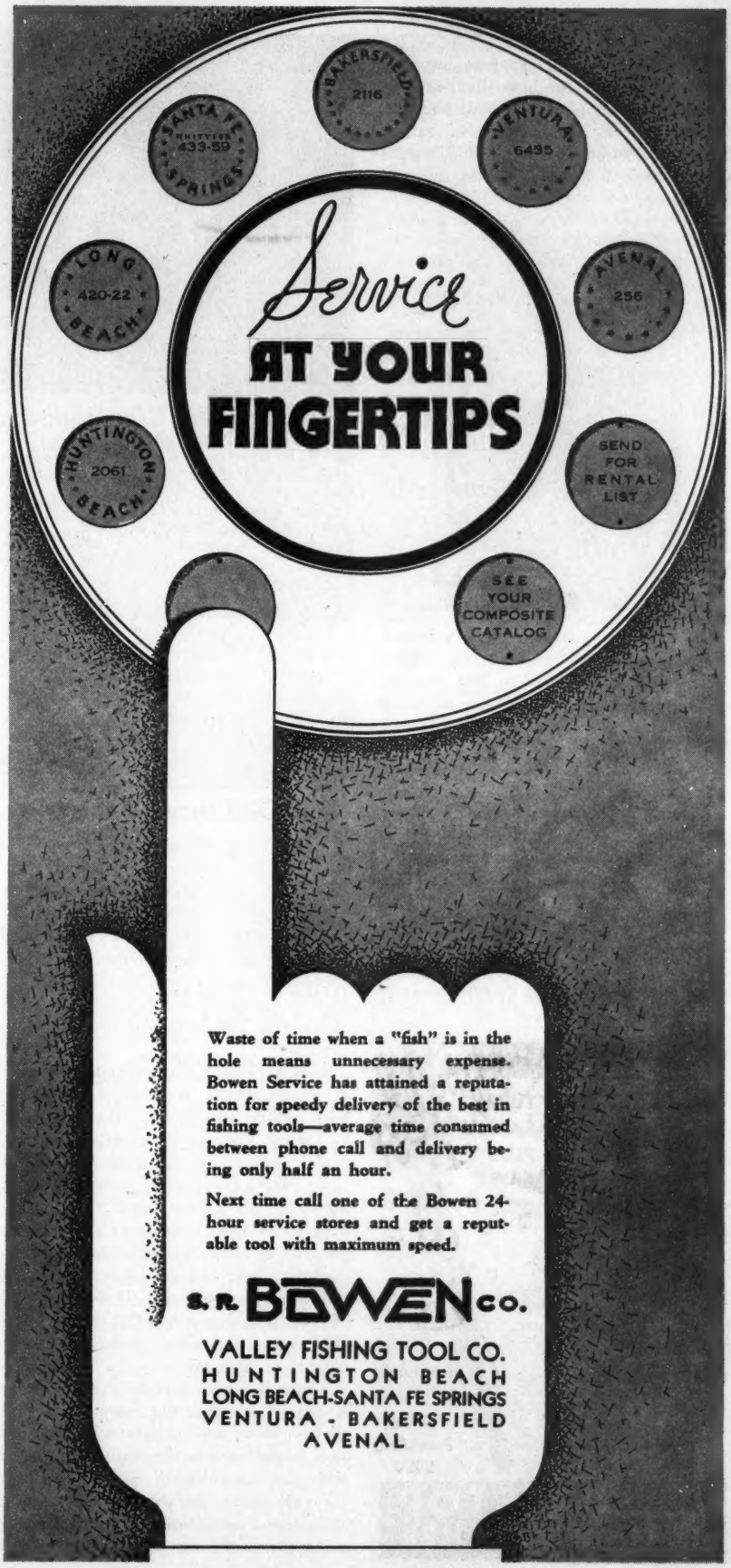
which can be changed if a different size is needed. Then we come to the adjustable beans, which are essentially needle valves. There are some standard needle valves that are suitable. The principal distinguishing feature of a needle valve intended for use as an adjustable bean is that it has a scale of openings. I feel there has been too much emphasis on marking and calibrating, and worrying as to whether that scale was exactly accurate, because, as you gas men know, different shaped orifices have different velocity co-efficients. And, as illustrated by Mr. Davis' slides, the different types of beans have entirely different shapes. Therefore, a certain area in one bean doesn't mean the same as in another. The area of opening, without knowledge of the velocity co-efficient has practically no significance.

Leaving the types of beans which Mr. Davis illustrated, there are others which are of some interest although not used to any great extent, involving use of a diaphragm to control the opening. Diaphragms may be hooked up in at least three different ways. The most obvious way is in the form of a back-pressure regulator wherein the diaphragm is so set as to maintain a fixed pressure at the well-head, regardless of varying flow. That may be an advantage under some special conditions.

The next type is the reducing-valve type of regulator, wherein the diaphram is so connected as to maintain a constant down-stream pressure. That hookup is being used at the present time for the purpose of maintaining a constant pressure on the trap from a high-ratio well in order to provide a constant pressure supply to a compressor serving a low-ratio well.

Experiments were also made some years ago with a volume-controller type of regulator, the diaphragm being connected up to the opposite sides of a butterfly valve in such a manner as to tend to maintain a constant volume of flow from the well. This was an attempt to control heading in a case where ordinary beans would not do so. This was completely unsuccessful because these volume controllers maintain a constant differential, and if they were working on a uniform medium they probably would be successful, but as the gas and oil separate into slugs, the regulator probably made the conditions worse. if anything.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G. P. Wins Award

To General Petroleum was awarded the first prize for the best silver-mounted group of horses in the great pageant. Included were 30 examples of saddle horse perfection, among which were several owned by Messrs. Sperry and Samuelson.

Ruth Samuelson, daughter of J. P. Samuelson, astride a 1,200-pound white Arabian horse named King, owned by Don Williams of Orange County. King was one of the 30 saddle horses entered in Bakersfield Pioneer Day parade by General Petroleum Corporation.

Trophy for the best silver mounted pair, which pair was included in the General Petroleum caravan, was awarded to Louis A. Zoller and Louise Ward. Second prize in the classification of best single outfits was awarded to Mr. Sperry.

A feature of the General Petroleum division in the parade was an old time stage coach, with Kern County pioneers as passengers.

FRANK H. HAMLIN—25TH ANNIVERSARY PARTY

Back Row (left to right)

R. D. Roberts, P. C. Weston, J. W. Miller, G. W. Schattner, R. E. Thorpe, W. P. Cassel, A. H. Kincaid, H. L. Blevans, F. C. Barr, C. J. Deasy.

Center (left to right)

Pat Thompson, L. C. Saunders, W. A. Newhoff, Lawrence Wolff, F. H. Hamlin, J. B. Arthur, S. D. Herkner, R. C. Ingram.

Front (left to right)

J. F. Gallagher, T. J. Bailey, W. B. Ring, P. C. Perry, E. M. McLachlan, C. G. Atwood, J. A. Douglas.

A GROUP of old friends recently gathered at the St. Germain Restaurant, San Francisco, to celebrate Mr. Frank H. Hamlin's twenty-fifth year of service with the Union Oil Company. Mr. W. A. Newhoff presented Mr. Hamlin with his service pin and congratulated him on his long period of service in the Sales Department.

The toastmaster for the occasion, Mr. S. D. Herkner, read the congratulatory messages which poured in on Mr. Hamlin from friends and co-workers scattered along the Pacific Coast from Seattle to San Diego.

New Oil Cleaner Announced

THE Service Equipment Company of South Gate, California, recently announced a new type cleaner which is particularly efficacious in thoroughly cleaning differential, transmission and crankcase oil. The Diamond-U Utility Cleaner circulates cleaning oil at the rate of 5 to 6 gallons per minute, effectively eliminating abrasives from the oil in the process.

Scientifically engineered and placed in a cabinet which has been designed for both utility and beauty, the Diamond-U Utility Cleaner is an attractive and useful addition to the equipment of the most up-to-the-minute service station. The top, all fittings, and a decorative band around the bottom of the case are finished in high grade chrome, which contrasts with baked black enamel on the sides of the case. The dimensions of the machine are 14½ inches wide, 20½ long, and 26¾ inches high, exclusive of fittings.

Through service tests extending upwards of a year, the machine is said to have done an excellent cleaning job, and is declared to be entirely practical and the source of good dividends through direct operating profits and the attraction of new business to the stations using it.

Five Years Without Lost Time

AN accident record established by the D & B Pump & Supply Company is 720,009 working hours without lost time. Credit for this remarkable performance is given to the fine work done by the Shop Safety Committee as well as to the cooperation of the employees as a group.

At a meeting held at the plan in honor of the occasion, J. S. A. Smith, Secretary and Treasurer of the organization, complimented those responsible for this exceptional safety record and urged all employees to carry on the good work by remaining permanently safety minded.

Mr. A. F. Macdonald, of the New Amsterdam Casualty Company, also addressed the gathering. In the course of a very interesting talk, Mr. Macdonald remarked that in the entire fifteen years he had devoted to safety engineering work, never before had he encountered a factory group so safety-conscious in every detail of careful action and as particular in regard to shop cleanliness.

■ ■ ■

Jack Crawford: "An old maid friend of mine is in her forties and wants to know whether she should slap a man down when he tries to get fresh."

Fred Currie: "At her age she had better let him have it."

May Have New Oil Sand

THE Tom Clark-Torrance's Kettler No. 2, Torrance, is reported to have penetrated an entirely new zone below 4000 to 4350 ft., at which depth the hole is now bottomed. According to P. W. Willett, who is in charge of drilling operations, this is said to be a different sand than that encountered by the C. C. M. O. Del Amo No. 23 in the latter's deep test. This hole was cored from 3500 to bottom. By this method the management was able to block off everything but the producing zones. At present the well is standing cemented and is expected to be placed on production within 10 days, Mr. Willett stated.

■ ■ ■

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, and MARCH 3, 1933.

Of California Oil World, published weekly at Los Angeles, California for October 1, 1936.

State of California, County of Los Angeles, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared W. S. Noblitt, who, having been duly sworn according to law, deposes and says he is the business manager of the California Oil World and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, Petroleum Publishers, Inc., 536 Petroleum Securities Bldg., Los Angeles, Calif.; Editor A. R. Hinton, 536 Petroleum Securities Bldg., Los Angeles, Calif.; Managing Editor, Walter C. Monroe, 536 Petroleum Securities Bldg., Los Angeles, Calif.; Business Manager, W. S. Noblitt, 548 Roosevelt Bldg., Los Angeles, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member must be given): Petroleum Publishers, Inc., a Corporation, 536 Petroleum Securities Bldg., Los Angeles, California; A. A. MacDonald, 133 No. Las Palmas, Los Angeles, Calif.; Ward B. Blodget, 606 No. Foothill Road, Beverly Hills, Calif.; Kinzie Miller, 7367 Hollywood Blvd, Los Angeles, Calif.; U. C. Murcell, Jonathan Club, Los Angeles, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above is: (This information is required from daily publications only.)

W. S. NOBLITT, Business Manager.

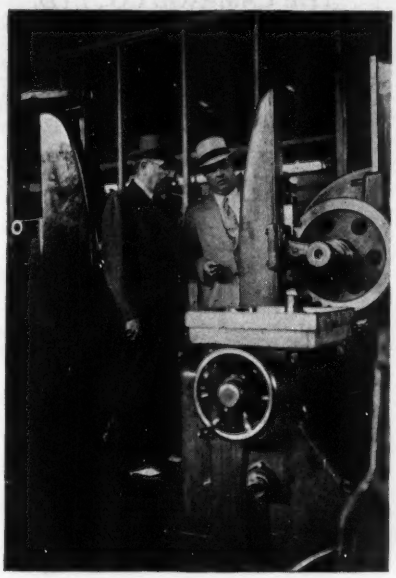
Sworn to and subscribed before me this 30 day of September, 1936.

(SEAL) NANCY HANSEN.

(My commission expires June 17, 1939.)

Emsco Installs Machine To Cut Sprocket Teeth

F. M. SMITH, president, and E. B. Fowks, newly-appointed manager of sales for California, and export sales manager of the machinery division of Emsco Derrick & Equipment Co., are shown inspecting one of the latest types of machines



which have been installed in the Los Angeles plant of the company, to machine-cut sprocket teeth. This is part of the extensive modernization and enlargement plan which Emsco is carrying out in its Los Angeles and Houston divisions. Many other new machines have been installed and additions made to the Los Angeles plant of the company in recent months. Oil men are cordially invited to inspect the plant at any time.

■ ■ ■

D. S. Fletcher, president of the Fletcher Oil Co., now operating a refinery on Bandini Blvd., Los Angeles, and a leading independent marketer of gasoline in Oregon, Washington and Idaho, is in Idaho at the present time on business and has been for some weeks past, the date of his return uncertain. Mr. Fletcher's company has won note by its importation from time to time of Texas gasoline for its northwestern trade. Last year he and his associates purchased the Los Angeles Refining Co's plant to get a supply of California gasoline, but it has been closed down for the avowed reason that it can not get the necessary crude to operate at a price which will permit the company to compete with the California majors, all of which are selling in its northwest territory.

During Mr. Fletcher's absence none of the employees will talk about any plans to ship gasoline from Los Angeles or about the possible effects of a marine strike upon the company's affairs.

■ ■ ■

Doyle Petroleum is going deeper in its well at Jasmine some 15 miles southeast of Delano. The well has just undergone a series of tests at 2892 ft., at which point there were indications that perhaps a producer might be brought in. However, while encouraging, the showing failed to indicate commercial value.

■ ■ ■

Marty Ellsworth walked onto a tennis court where a tournament was in progress. "Whose game?" he asked.

A shy young thing sitting near him looked up hopefully.

"I am," she replied.

■ ■ ■

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NOTICE OF RECEIVER'S SALE

Ed McAdams, Receiver of Dollar Oil Corporation, Ltd., will sell at public auction on Oct. 29, 1936, at 10 a.m. at the Broadway entrance of the Hall of Records of Los Angeles County, 220 N. Broadway, Los Angeles, Cal., all of the property, estate and effects of the Dollar Oil Corporation, Ltd., except the current assets, etc. The court has fixed a minimum price of $60,000.00. For terms and conditions of sale and description of property see the original "ORDER FOR SALE BY RECEIVER FREE AND CLEAR OF LIEN OF TRUST INDENTURE" in the office of the clerk of the U. S. District Court, Federal Bldg., Los Angeles or notice of sale published in the Los Angeles Daily Journal on Oct. 1, 8, 15, 22, or 29, 1936. Copies of such notice are available, as long as supply lasts, at 1109 Rowan Bldg., Los Angeles. Attention is particularly called to par. (6) of the order, which provides that bidders must deposit $500 at or before noon of the day preceding the sale. Among the properties being sold is the interest of Dollar Oil Corporation, Ltd., in Hoyt Well No. 3, Hoyt Well No. 4, Hoyt Well No. 5, Hoyt Well No. 6, Hoyt Well No. 8, Olympia Well No. 9, Dollar Well No. 8, Dollar Well No. 6, and Dollar Well No. 9, together with other properties. An appraisement of the properties to be sold was made as of May 1, 1935. The original is on file in the office of the clerk of said court. Copies can be secured, as long as supply lasts, at $1.25 each, at 1109 Rowan Bldg., Los Angeles, or 1675 Loma Ave., Long Beach. 10-15

Cracking Development Conference

THE eighth annual Cracking Development Conference, attended by a group of leading petroleum technologists, held its sessions, September 22, 23, and 24, at Essex House in New York City. Participating in the Conference were representatives of the Standard Oil Company (Indiana), The Texas Company, The Standard Oil Company of New Jersey, Gasoline Products Company, and The M. W. Kellogg Company. William F. Moore, President of Gasoline Products Company, was General Chairman of the meetings.

Members of the Cracking Development Conference meet annually to consider the latest advances in design and engineering, research and development, and plant operation, pertaining to the processes of cracking for the production of gasoline. Cracking technology has become highly complex and its literature voluminous. The Conference is found increasingly valuable as a coordinator of results. It serves as a clearing house for improvements, and acts as a committee on standards used in the design of cracking equipment.

On September 23, the Conference was privileged to view some of the largest welded steel vessels in the world, now being built in the plant of The M. W. Kellogg Company, at Jersey City. These housings, frequently in the form of giant steel cylinders closed at the ends, are being constructed for the Texas City, Texas, plant of the Pan American Petroleum and Transport Corporation. The installation for which they are being built will constitute one of the two largest cracking plants in the world. The visiting technologists were given opportunity to study the advances which have been made in the welding technique applicable to very large units, also to observe the corrosion protection methods most recently being used in the petroleum industry.

The object of the Cracking Development Conference is to correlate experimental and plant development work in pyrolytic cracking, which is carried on in the laboratories and refineries of the participating companies. Development of new features in the design and operation of equipment for pyrolytic cracking is a function of several associated refiners, the results of which are available to licensees. Designs and improvements pertaining to the several processes, as well as combination units, are licensed to the industry under the scope of cracking patent rights of the Gasoline Products Company.

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